دستور الأدوية الدولي

The International Pharmacopoeia

الطبعة الثالثة

Third Edition

المجلد الأول

Volume 1

طرق عامة للتحليل

General methods of analysis

تمت الترجمة في المركز العربي للتعريب والترجمة والتأليف والنشر بدمشق

منظمة الصحة العالمية 1979

World Health Organization 1979

The International Pharmacopoeia

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AMENDMENTS AND CORRIGENDA TO VOLUMES 1,2,3 AND 4

ɋøøĭøNJøDŽøŀ

ĞŁĦŧƨă øäÀÕö ĦØŁÅÀǩ *International Pharmacopoeia* ƁşÆöä Ğʌşåɟă øzϙèå ĞŁʇÅĦöä ĞHʊÔöä ĞŧŢʌɳ ğÀÎɸ Ʉøɸ₳ǰõäş 1951 ȳÅȝ Ž òşɟă ÛƀʌÆŸƒ ŌȮÎæ Ɓşɟă ĞĦĞÛöä ğÀÎŀ Æęş .WHA1.10[1] ĞŁÒÅĦöä ĞHʊÔöä ĞŧŢʌʇ ĞŁɳzŧĦöä ĞŁÊɸÀÀöäş ĞʌÂŁŸƱqă ğÅ8ŸöÅæ ÅŦŸõ ğÀÎɸ Ü1959 ȳÅȝ Ž supplement ĞŁŸŁŧȮǩ ĞzÅŕüæ ÅĦĞǩŴ Æęş Û1955 ȳÅȝ Ž ĞzÅŕüæ ǨĦĞǩŴ Û1967 ȳÅȝ Ž ĞŁɸ₳ǰõä ĞĦĞÛöä ğÀÎŀşş .ĞŁɸ₳æÅŁõäş ĞŁɸ₳ʇɟă ƙϙ8ŸöÅ Бŭ ĞƤÀϙöä ŴŘʌŭ ğÀÎŀşş .ĞŁɸ₳Gèqăş .ĞŁɸ₳Gèqăş ĞŁèşÀäăş ĞŁÊɸÀÀöäş ĞʌÂŁŸƱqă ğÅ8ŸöÅæ ğǿÆò Æę ÅŦŸõş .1971 ȳÅȝ Ž ĞŁŸŁŧȮǩ ÅŦʌÀʌÀÕǩ Ž ÛĞŁʇ₳ĦöäĞHʊÔöä ĞŧŢʌʇ ĞĦæÀϙöä ĞŁɸrÆŁÔöä ğ₳ÀŘHʊϙÊʇă ğ₳Àòäzɳ ĞòÅʅă ğƎʅă ĞʌƨĞĦĞDZäÅɳş ʒÅϙɸ₳ş Ɓşʌ̈ă Ğʌşåɟă ózϙèå ĞŁÕʌϙæ ĘŸĦϙʌ ÅŧŁz Ōŧĸöä ʅŁŢʌǩ ÛƀʌÀÎĦöäş âåÅÊöäş ƀʌÀÎĦöäş Èɳ₳ʅă ğÅʌzȯişŭ Ǩèóŭş Ğŧ₳Ɏɳ ğäöäÀDZäæ ĞADzŸöä ØÓŁ Ǩòşŭ Æęş .ĞŁʇ₳ĦöäĞHʊÔöä ĞŧŢʌɳ Ōŧ̈ê ƀɳ ğózΐÅʇă ğåzƨă ğÅÀòäzɳ óäÀŧϙèă" ȳÀĦöä ÀʌÁŁʇă ƀɳ ǨĞŸù Ʉøϙöä ÛWHA20.34[2] ĞŁʇ₳ĦöäĞHʊÔöä ĞŧŢʌʇ ĞĦɳzŧĦöä ĞŁĦŧƨă ğäóäÅę ØŁÅʌǩ ŌDZŭ ƀɳ ÀʌzÛǩ Ž óäÀŧϙèɾă" ȳ₳ĦöäÀʌÁŁʇă ƀɳ ǨĞŸù Ʉøϙöä ÛWHA28.66[3] ğäøäÀÕöäş Û"ĞŁŸŁŸHuϙöä ĞæåęÀöä ğÅÀòäzɳ ƨŸȝ Ōŧĸöä prophylactic ĞŁƐ₳ÕǩɾĂ åäzʇă åäzŧĸŸõ ĞʌåÅìóqă Ōəɾ₳Éöäş ğ₳ĞŸÛϙʇăş ĞŁõşÆöä KʌÀĦʇă ĞŁÕÅǩş È₤èüÕæ ĞÕŸĦϙʇă ĞÛÎɸɟă ."therapeutic ĞĒDZŸĦöäş

ğÆȝ Ž ÅÎæ ȣzè ƁØöä ÛƁşÉöä Ğʌşåɟă ózϙèÉö ĞŽõ₳Žöä ĞĦĞÛöä åäÆȝŭ ƨŸȝ Ōŧĸöä ƁÀz Ûğ₳ŁòzϙöäĞØT ŴÕzşş ƨŸȝ ƁzϙƠ Ʉøϙöä ğäÆŸÖ₳æ ȝϙϙ ȣzè ÜŌŁŸHuϙŸö ĞnɸĦöä à₳ÛöäZ ò̈ş ƨŸȝ 1 ÆŸÖä Ɓzϙʒ .volumes ğäÆŸƒ Ž ₤ɾÅŧĸϙèä Ä₳õɟă Ğʌşåɟă ÕŸϙö Бş̈ ŌȮÎæş ÛŴʌåäÀzŭ ĞʌşåQϙ ğåzƨă ğ₳Àòäzɳ ÛƁŭ Ûmonographs ğäåşÀzǧă .ĞnɸĦöä ĞŁHʊÔöä ĞʌÅȝÀöä

åäzʇă ğåzDZ ɹÅŧŕ ĞʌÅȣö ÅőÆəÅz ƨŸȝ ĞžõÅŽöä ĞĦĞÛöä ƀɳ 1 ÆŸÖä Ž Ğözŧ̈Îʇă ğäöäÀDZqäş à₳Ûöä ŏÅŌϙă Æŧϙȝă Ōò₳Σă ȳÆŌϙöä ȝɳ Æõäzϙǩ ÅŦŸĦƨ ĞÕæÅÊöä ğ₳ĦĞÛöä ƀɳ ğæzǵüʇă à₳Ûöä ƨŸȝ gÆʌÆȝ ğɎ₳ÆĦǩ ǨʌÀDZŴ Æęş .ĞŁɸrÆŁÔöä ğ₳GÕĦöäş Ğȝzʌϙʇă ĞŁÆÕϙöä ğ₳GÕĦöä ÛÕöæ ȝɳ Ûǿ₳Gϙȝɾă ƙĦæ ğǿnŴ Æęş .gÆʌÆƨă ĞŁŸŁŸHuϙöä ğäåşåɟă ózÛǩ Ž Ǵŧ̈Êǩ Ûòzɳüɳ zŁ Å̈ŧõ ÛÅŒŭ ǪŁŒŴ ƨŸŽɳ òzŸg õ₳Ł Ǩɸ₳õ ÆÕz Åŏ ƨòzʇă ğäöäÀDZqă ǿÅŁϙnă ÆʌȝŞ ÛĞʌåÅÔϙɾɾă

.127 ĞHʊÂÔöä Û1973 û1 .ÆŸÖä ÛĞŁʇÅĦöä ĞHʊÔöä ĞŧŢʌɳ ğäöäÀęş òzŸg ÆŁϙõ [1]

.132 ĞHʊÂÔöä Û1973 û1 .ÆŸÖä ÛĞŁʇÅĦöä ĞHʊÔöä ĞŧŢʌɳ ğäöäÀęş òzŸg ÆŁϙõ [2]

.52 ĞHʊÂÔöä Û1979 ÛĞŽöÅŽöä ĞHĞÛöä ÛII .ÆŸÖä ÛĞŁʇÅĦöä ĞHʊÔöä ĞŧŢʌɳ ğäöäÀęş òzŸg ÆŁϙõ [3]

[illegible]

[illegible] 1 [illegible] WHO Expert Advisory Panel [illegible] 1 [illegible] 1978/[illegible] 1977-1974 [illegible]

[illegible]

.ğ øzϱõÆïä ÜÀʌóÀ8ʜŁ ÛǨÊäääåzä ÛĞöÆŁÔŸö ʊøʌùzïä ÆƬĦţä ÛʊȮÊzzïàʀ .ʒ æÀϱèjˌä ÜßÀÊʌzè Ûȯàʟä ÛʊDzŁDZ øzϱõÆïä ÜĞŁȮʌÀnˌjˌä gÆHʊϱţä ğÀʌʀzïä ÛȄʌzȯ ǨφÀè Ûöäşƹäşˌ öäØ8ïä gøäåÛ ÛĞʌşåˌjˌä ÕŁŸHʊϱö ʊøʌùzïä ÂõÀţä Û8zŸʌʀ ÛĞʌşåˌjˌä ĞʌÀʌÁƞ Ûɹzϱ̂Eö .ʒ.Ů øzϱõÆïä ÜßÀϱŸʊõä ÛɹÆÁö ÛĞĢęäÀţäş ĞŒDZzȯzŁĞöä KʌÀĦŧŸö ʊøʌùzïä ÆƬĦţä ÛɹşÀĢϱʌʀş .ʒ .å.ȳ æÀϱèjˌä ÜĞŁȮʌÀnˌjˌä gÆHʊϱţä ğÀʌʀzïä ÛzϱöŮ zȯÀʟ ÛäÂöŮ ĞŁφşÀĦǨ ÛÀʌåÁƞ .ʒ.ş ÆŁÊïä ÜßÆÁõ ÛzʌóÀϱφşŮ ÛäşåǨşŮ ÛzʌózǨäózäŸŁõʀ ÛcbÆŧŁφ .Ʀ øzϱõÆïä ÜÆèşó ÛϒŁzzÊïä åÀƠʀä ÛʊèşÀïä Ğʌşåˌjˌä øzϱèå Ğʌƨ ÛʊȮÊŁzzȮèÀƞ ÛÀφÀŁşŮ ÆŁÊïä ÜϒŁzzÊïä åÀƠʀä ÛzȮèzƞ ÛʊèşÀïä Ğʌşåˌjˌä øzϱèå Ğʌƨ ÛÀzzõÀPzäŮ .ɹ.Ů øzϱõÆïä ÜßÆÁŸÀz ÛʊȮʌÊŸŁ ƎϱÁţä Ûʊõşˌä Bşʀşˌ .ğ øzϱõÆïä ÜÆʌzÊïä ÛÀʌózè ÜĞŁţÀĦöä ĞHʊÔöä ĞŧṬÀƞ 3ƞ ɹşÀĦϱţä ĞŁĦDZÀţä ĞŁəÀŁŧŁÒöä åäzţä ÂõÀƞ .ȳ øzϱõÆïä ÜäÀÊʌzè ÛÑʌóşà ÛĞöÆŁÔöä ÆƬĦƞ ÛÀŁöKä .x æÀϱèjˌä ÜÀʌKDzŁφ Ûâzϱʀ Ğʌʀş ÛÀäÀʌ ÛĞʌåşˌjˌä ĞϱęäÀţ Бäó ÆŁÀöä ÜĞŁùäÀÕɛÆöä ÀŁφÀţŮ Ûköää ÛĞŁùäÀÕɛÆöä ÀŁφÀţj ÀϱƐó ÆƬĦƞ ÂDZ æÀϱèjˌä ÜÀÊφÀz ÛÕŁÀÀŁƞşó Û8ŸõşŮ Õèşó ÛÀŁÊä .å .â æÀϱèjˌä ÜĞŁȮʌÀnˌjˌä gÆHʊϱţä ğÀʌʀzïä ÛcbÛÁʌìäş Ûöäşƹäşˌ öäØ8ïä gøäåÛ ÛĞʌşåˌjˌä ÆϱȮƞ ÛɹÀƞÂkóäzì .ʒ øzϱõÆïä ÆƬĦţä Ûʊõşàzè .Ʀ øzϱõÆïä ÜϒŁzzÊïä åÀƠʀä ÛzȮèzƞ ÛƁåÀƠʀä ĞŁəÀŁŧŁÒöä ĞŁφʀÆÔöä ϱzHʊĞöä ÆƬĦƞ Û8zȯzõzè ĞŁφʀÆŁÔöä ğÀDzϱÀţä ĞϱęäÀţ ŋʌÒŁä ÆƬĦƞ ÛzÎk–ŋʌè ǩ ÆŁÊïä ÜɹÀäŁÊöä ÛzŁõzù ÛĞŒHʊHʊÔϱöä ȳzŸŸö ʊøʌùzïä ĞŁφʀÆŁÔöä ğÀDzϱÀţä ĞϱęäÀţ ŋʌÒŁä ÆƬĦƞ ÛĞŁì – zõzǩ ÆŁÊïä ÜĞŁĞHÎöä ǩÔöä ĞʌózƬP ÛŋʌÒŁä ÛĞŁDZzȯzŁĞöäş ÛÀŁzåŸŁz ÛÕĞφÀǩ ĞĦƞÀDZ ÛĞöÆŁÔöä Ġèóƒƞ ÛɹÀõKõzǩ .ȳ.ȳ øzϱõÆïä ÜĞŁĞHÎöä ǩÔöä ĞʌózƬP ÛŋʌÒŁä ÛÀŁDZzȯzŁĞöäş ÛZŁŁŸŁèÀz øzϱõÆïä ÜÀÒŁDzŸä ÛɹÀzzȯ ÛƆʀÆŁÔöä Á8ʌó ÆƬĦƞ ÛŋŁŁóÆφÀz .øŁ æÀϱèjˌä ÜĞŁȮʌÀnˌjˌä gÆHʊϱţä ğÀʌʀzïä ÛƁóÀ8ʜTä Ğʌşåˌjˌä øzϱèå Ğʌƨ ÛŋŁz .Ů øzϱõÆïä ÜÀŁφÀnşó ÛǨèóÀnzä ÛƆʀÆŁÔöä ǪHʊĞöäş Ğʌşåˌjˌä ĞϱęäÀţ ĞõşÆöä ÆƬĦƞ ĞõÀì ÛÈŸʌş .Ů.ā øzϱõÆïä ÜßÆÁõ ÛzʌóÀϱφşŮ ÛäşåǩşŮ ÛʊȝÀĦìqä ÆÛöä ɭÊę ÛÌŸʌş .ʒ.ş ÆŁÊïä ÜÀʌóÀ8ʜŁ ÛǨÊäääåzä ğÀʌʀzïä ÛcbÛÁʌìäş Ûöäşƹäşˌ öäØ8ïä gøäåÛ ÛĞʌşåˌjˌä ĞϱǪÒƞ ÛǨÀäó .ş.ş øzϱõÆïä ÜßÀǪŸʊõä Ûóşş Ûgåşƹ÷ä ÈʌƎφÀŁ dbÙ .ĞŁȮʌÀnˌjˌä gÆHʊϱţä

Ğʌşåˌjˌä øzϱèå Ğʌƨ ÛĞʌóØöä ĞęÀÛöä ĞÀŁŁ ĞöÀõş dbƞ ğÀHʊŁȑzϱöäş ğÀÖŁŸHϱöä ɔŸȝ ÕÔHʊɭèä ÆÖz ÛÕöæ dbƞ ÄȷõÙ Ğʌƨ ÛĞʌåÀƠʀä ÀŁφÀţj Ğʌşåˌjˌä øzϱèå Ğʌƨ ÛʊÊφÀÀöä Ğʌşåˌjˌä øzϱèå Ğʌƨ ÛʊõóÀyäÆöä Ğʌşåˌjˌä øzϱèå ÈŸf ÛĞʌşÀÊŧʌöä dbƞ ÑR̈Ůş ÛƁÆʌzÊöäş ĞŁφÀnşÀöäş ĞʌóÀ8ŸGöä ĞHʊÔöä ğäóäàş dbƞ ÜʊÒʌÀnˌjˌä Ğʌşåˌjˌä øzϱèåş ÛƁóÀ8ʜTä Ğʌşåˌjˌä øzϱèå ϱzHʊĞöä ɭÊęş äÆʌõ ÛzʌóÀϱφşŮ ÛäşåǩşŮ ÛĞŁəäşÆöä ϱzHʊĞöä ğäƎQƯ ÛÀŁöäÀϱèä ÛäKφÀõ Ûŧùzöä ĞŒDZzȯzŁĞöä KʌÀĦţä ƎϱƯ .ğÀgäÀϱęäş ğÀÕŁŸHǩ ĞŁÆƬţä ğÀŁĦŧɛä ŔĦæ ǨnÆę ÛÕöæ Бٍ ĞzÀȑٍ .äÆφŸʌàzŁφ ÛɹzϱȣʜÆŸʌş ÛĞŁȝÀʌÔöäş ĞŁŧŸĦöä äØŁ ßäÆȝٍ Ž äzõóÀì dbʌØöä ÆŁÀĦţäş î ÀÁìˌjˌä ÕÒö ÀŁÀÒì dȝ ƎĦϱö ĞϱèÀʌţä ℂØŁ ĞŁţÀĦöä ĞHʊÔöä ĞŧṬÀƞ ÂƬϱǩ .ÆŸÕä

ğÀÀòäzη ĞòÀlˌä gƎlˌä ĞʌDzŸö ℂŸȝٍ gózõØţä ğÀȝŧϱDZŸö ÈŁəÀõ ɹzÊϱzDZ .Ů .â ÆŁÊïä ÿÆn ÆÕö

Æ(Ò)ƫ È‫ڎ‬ø Û‫ڭ‬ƫ‫ڜ‬.‫ڜ‬ Æ‫ڎ‬Ê‫ڎ‬ Ć‫ڄ‬Dz‫ڎ‬ Ƙ‫ڭ‬À‫ڎ‬È Ć‫ڄ‬Æ‫ڜ‬z‫ڄ‬ ȳ‫ڄ‬ę Æę‫ڜ‬.Ć‫ڎ‬ƫ‫ڄ‬Ĥ‫ڎ‬ Ć‫ڎ‬Ô‫ڎ‬ Ć‫ڭ‬Ţ‫ڄ‬ƫ Ć‫ڎ‬ƾ‫ڄ‬Æ‫ڎ‬Ô‫ڎ‬ ğ‫ڄ‬À‫ڄ‬Rƫ(Ò)Ê‫ڎ‬ƫ .ȳ ĆÊ(ò)ø‫ڄ‬ ¢‫ڭ‬Æ‫ڜ‬Ĥè Æę‫ڜ‬ Û‫ڜ‬ƾ‫ڄ‬Æ‫ڎ‬Ô‫ڎ‬ Æ(Ò)ƫ‫ڄ‬ Ʊ‫ڄ‬ş‫ڜ‬ƫ Ƙ‫ڎ‬õ Û‫ڎ‬Ò‫ڄ‬Ê‫ڜ‬Ĥ‫ڄ‬Æ‫ڄ‬‫ڜ‬.‫ڜ‬ Æ‫ڎ‬Ê‫ڎ‬ş Û‫ڎ‬Ć‫ڎ‬ƫ‫ڄ‬Ĥ‫ڎ‬ Ć‫ڎ‬Ô‫ڎ‬ Ć‫ڭ‬Ţ‫ڄ‬ƫ dƫ ę Û‫ڜ‬ƾ‫ڄ‬Æ‫ڎ‬Ô‫ڎ‬ .Ć‫ڎ‬Æ‫ڄ‬Õ(ò)‫ڎ‬ ğ‫ڄ‬Æ‫ڜ‬Ĥ‫ڄ‬Ê‫ڎ‬ƫ Û‫ڄ‬Æ‫ڎ‬ƽ

ƱÛ‫ڜ‬Ĥ Æę‫ڜ‬ .Õ‫ڎ‬ŸHƱ(Ò)Ÿ‫ڎ‬ Ćƫ‫ڄ‬Ĥ‫ڜ‬ Ć(Õ)‫ڄ‬À‫ڜ‬ù 42 ø‫ڎ‬ Z‫ڜ‬ò‫ڜ‬ ƾŸ‫ڜ‬ Bę‫ڄ‬Æ‫ڎ‬ Ć‫ڄ‬ş‫ڄ‬Ć‫ڄ‬j‫ڄ‬ ø‫ڜ‬z(Ò)è‫ڄ‬Æ‫ڎ‬ Ć‫ڎ‬Ĵ‫ڎ‬À‫ڎ‬Ĵ‫ڎ‬ Ć‫ڎ‬Hƫ‫ڜ‬Û‫ڎ‬ dƫ 1 Æ‫ڎ‬Ÿ‫ڄ‬ Ƀz(Ò)Ʒ Z‫ڜ‬ò‫ڜ‬z‫ڎ‬ ‫ڄ‬Ø‫ڜ‬ dƫ Æ‫ڎ‬Ô‫ڎ‬ƫ ȷ‫ڄ‬À‫ڎ‬õ Æę‫ڜ‬ .‫ڄ‬ò ƾ‫ڜ‬ò‫ڜ‬ƫ ğ‫ڎ‬Ä‫ڎ‬Ò‫ڄ‬À‫ڎ‬Ć‫ڎ‬Dz‫ڎ‬ż‫ڄ‬ Ĥ‫ڜ‬ƾ‫ڎ‬ƫ‫ڜ‬õ‫ڜ‬ƽ‫ڄ‬À‫ڄ‬Æ‫ڄ‬Ć‫ڎ‬ş Ć‫ڎ‬Ę‫ڄ‬À‫ڄ‬Â‫ڄ‬Æ‫ڄ‬À‫ڎ‬ä‫ڎ‬ş Ć‫ڎ‬Ę‫ڄ‬À‫ڄ‬Ĥ‫ڄ‬Æ‫ڄ‬À‫ڎ‬ä‫ڎ‬ş ȧ‫ڄ‬À‫ڜ‬Û‫ڎ‬ƫ ļ(Ò)Ĥƫ Ƀ‫ڄ‬Æ‫ڎ‬Ÿ(Ò)‫ڄ‬ Z‫ڜ‬ò‫ڜ‬ş ø‫ڜ‬z(Ò)è‫ڄ‬Å Ž g‫ڎ‬ø‫ڜ‬z Î‫ڄ‬ƫ ğ‫ڄ‬Ä‫ڄ‬ò‫ڄ‬ż‫ڄ‬ƫ ò‫ڄ‬ƒ ƺø‫ڄ‬Ĥ‫ڜ‬ƾ ø‫ڜ‬ò‫ڜ‬ƾ‫ڄ‬ Ć‫ڎ‬ş‫ڄ‬Æ‫ڎ‬ƫ g‫ڄ‬Å‫ڜ‬DZ ȷ‫ڄ‬ƫ‫ڜ‬ Ć‫ڄ‬Ĥ‫ڜ‬ Ć‫ڎ‬Dƫ‫ڜ‬j ȧ‫ڄ‬À‫ڜ‬Û‫ڎ‬ƫ ¢Ø‫ڜ‬ ÿ‫ڄ‬Æ‫ڄ‬Á(Ò)è‫ڄ‬ Ć‫ڎ‬Ę‫ڜ‬Ê‫ڜ‬ ÿ‫ڄ‬Ĥ‫ڎ‬ƫ .Bş‫ڜ‬Æ‫ڎ‬ƫ Ć‫ڄ‬ş‫ڄ‬Å‫ڜ‬j‫ڄ‬

Ć‫ڎ‬Ğ‫ڎ‬Û‫ڎ‬ƫ Ž Ć‫ڜ‬Ÿƫ‫ڜ‬(Ò)Ê‫ڎ‬ƫ â‫ڄ‬Ê‫ڎ‬Õ‫ڎ‬ƫ units ğ‫ڄ‬Æ‫ڜ‬Ğ‫ڎ‬ş ȷ‫ڜ‬ż WHA30-39[4] Ć‫ڎ‬ƫ‫ڄ‬Ĥ‫ڎ‬ Ć‫ڎ‬Ô‫ڎ‬ Ć‫ڭ‬Ţ‫ڄ‬ƫ Ć‫ڎ‬ƺ‫ڜ‬ƾ‫ڄ‬Ĥ‫ڎ‬ Ć‫ڎ‬Hƫ‫ڜ‬Å‫ڎ‬ ø‫ڄ‬Å‫ڄ‬Õ‫ڎ‬ Ĥ‫ڄ‬Õ‫ڎ‬ş‫ڜ‬ş ÀŢ‫ڎ‬ä) International System of Units (SI) ğ‫ڄ‬Æ‫ڜ‬ğ‫ڜ‬ż‫ڄ‬Ÿ‫ڎ‬ Ʊ‫ڄ‬ƫ‫ڜ‬Ĥ‫ڎ‬ ȳ‫ڄ‬Ţ‫ڄ‬À‫ڎ‬ä ƾŸ‫ڜ‬ ğ Æ‫ڜ‬ƫ(Ò)‫ڜ‬ä Æę Bş‫ڜ‬Æ‫ڎ‬ƫ Ć‫ڄ‬ş‫ڄ‬Å‫ڜ‬j‫ڄ‬ ø‫ڜ‬z(Ò)è‫ڄ‬Æ‫ڎ‬ƫ Ć‫ڎ‬Ğ‫ڎ‬Ä‫ڎ‬Ò‫ڄ‬À‫ڎ‬Ć‫ڎ‬Dz‫ڎ‬ż‫ڄ‬ .(3 Ć‫ڎ‬Hƫ‫ڄ‬À‫ڎ‬Ô‫ڎ‬ƫ

î‫ڜ‬ş‫ڄ‬À‫ڜ‬Î‫ڎ‬ä‫ڜ‬ş Ć‫ڎ‬Ê‫ڎ‬ƫ‫ڜ‬Ê‫ڜ‬À‫ڎ‬ä Ğ‫ڄ‬Ĥ‫ڎ‬Hƫ‫ڜ‬Ÿ‫ڎ‬Û‫ڎ‬Ô‫ڎ‬ƫ‫ڜ‬Ĥ‫ڄ‬ Ć‫ڎ‬Ğ‫ڎ‬Ÿ‫ڎ‬Hƫ‫ڜ‬Ò‫ڎ‬ƫ‫ڜ‬Ğ‫ڄ‬Ĥ‫ڎ‬Ć‫ڎ‬Ğ‫ڎ‬Ÿ‫ڎ‬Ć‫ڎ‬Ğ‫ڎ‬Û‫ڎ‬ƫ dƫ 1 Æ‫ڎ‬Ÿ‫ڄ‬ ø‫ڄ‬Æ(Ò)ƫ‫ڜ‬ Ʊø‫ڜ‬ƫ Ć‫ڎ‬ƺ‫ڜ‬Ĥ‫ڎ‬ ğ‫ڄ‬Ţ‫ڄ‬Ğ‫ڎ‬Ÿ‫ڎ‬ƫ Ʒ‫ڄ‬è‫ڜ‬ƾ Ȣ‫ڜ‬è .Ğ(Õ)‫ڄ‬Ğ‫ڎ‬Ÿ‫ڎ‬ƫ ğ‫ڄ‬Æ‫ڎ‬Ÿ‫ڄ‬Ć‫ڄ‬ Ž Õ‫ڎ‬Ÿ‫ڎ‬Hƫ‫ڜ‬(Ò)Ÿ‫ڎ‬ Ć‫ڎ‬ƺ‫ڜ‬Ĥ‫ڎ‬ ȧ‫ڄ‬À‫ڜ‬Û‫ڎ‬ƫ Ʒ‫ڄ‬ƫ Ę‫ڜ‬ż‫ڄ‬ż‫ڜ‬(Ò)‫ڄ‬À‫ڜ‬ Ę‫ڎ‬Ć‫ڎ‬Û‫ڎ‬(Ò)Ÿ‫ڎ‬ Ć‫ڎ‬Ÿ‫ڜ‬À‫ڄ‬Ô‫ڎ‬ƫ

ȷ‫ڜ‬Ò‫ڄ‬ Bş‫ڜ‬Æ‫ڎ‬ƫ Ć‫ڄ‬ş‫ڄ‬Å‫ڜ‬j‫ڄ‬ ø‫ڜ‬z(Ò)è‫ڄ‬Å ȷ‫ڄ‬ż .Ĥ‫ڄ‬Å‫ڄ‬Ù ø‫ڜ‬z‫ڄ‬Õ‫ڄ‬Ø‫ڜ‬ƫ WHA3.10 Ć‫ڎ‬ƫ‫ڄ‬Ĥ‫ڎ‬ Ć‫ڎ‬Ô‫ڎ‬ Ć‫ڭ‬Ţ‫ڄ‬ƫ Ć‫ڎ‬ƺ‫ڜ‬ƾ‫ڄ‬Ĥ‫ڎ‬ Ć‫ڎ‬Hƫ‫ڜ‬Å‫ڎ‬ ø‫ڄ‬Å‫ڄ‬Õ‫ڎ‬ Ĥ‫ڄ‬Õ‫ڎ‬ş‫ڜ‬ş Ò‫ڜ‬n‫ڄ‬Æ‫ڄ‬Ğ‫ڄ‬ B Å‫ڄ‬ę Û‫ڄ‬Æ‫ڎ‬Ÿ‫ڄ‬Å Bş Å‫ڎ‬õ‫ڄ‬Ø‫ڄ‬Å Ć‫ڎ‬ƺ‫ڜ‬ƾ‫ڄ‬Å‫ڜ‬ę Ć‫ڎ‬õ‫ڄ‬À‫ڄ‬g Õ‫ڎ‬Ò‫ڜ‬Î‫ڄ‬Ğ Ʊ‫ڄ‬Û À‫ڜ‬Ƒ‫ڄ‬À‫ڜ‬ę Æ‫ڎ‬Ô‫ڎ‬Ø‫ڄ‬Ğ r Ʊø‫ڜ‬ƫ‫ڄ‬ş Å‫ڎ‬õ ƺ‫ڎ‬ò‫ڜ‬ƾ‫ڄ‬ ğ‫ڄ‬À‫ڄ‬Ò‫ڄ‬Å‫ڜ‬ƾ‫ڄ‬ş ȧ‫ڄ‬À‫ڜ‬Û‫ڎ‬ƫ dƫ ę Ć‫ڎ‬Hƫ‫ڜ‬Ğ‫ڄ‬Ĥ‫ڎ‬ƫ Ć‫ڎ‬Hƫ‫ڜ‬Ø‫ڄ‬Ğ‫ڄ‬Ĥ‫ڎ‬ƫ È‫ڄ‬è‫ڄ‬ú‫ڄ‬Ğ ȷ‫ڄ‬Ù dƫ Ò‫ڜ‬Ò‫ڜ‬Ɛ Ʒ‫ڄ‬Dƫ‫ڜ‬Ğ‫ڄ‬Å‫ڜ‬Ĥ‫ڜ‬õ ȳ‫ڄ‬Æơ Ʊ‫ڜ‬Ò‫ڄ‬ Å‫ڄ‬Ĥ‫ڜ‬ Ć‫ڎ‬ę‫ڄ‬Æ‫ڎ‬Ô‫ڎ‬ę ÀŢ‫ڄ‬Ĥ‫ڜ‬Ò‫ڄ‬ş Û‫ڄ‬Æ‫ڎ‬Ē‫ڄ‬È‫ڄ‬Å‫ڄ‬ę Ʒ‫ڄ‬Ĥ‫ڄ‬À‫ڎ‬Î‫ڜ‬ƾ Æ‫ڎ‬Ê‫ڜ‬ğ Ć‫ڎ‬Ĥ‫ڄ‬À‫ڜ‬8‫ڄ‬ğ‫ڄ‬ Ć‫ڎ‬Ø‫ڜ‬Ţ Bƫ‫ڄ‬À‫ڎ‬Ô‫ڜ‬ğ Ò‫ڜ‬Ò‫ڜ‬Î‫ڄ‬ä Ć‫ڎ‬Ę‫ڜ‬Ĥ‫ڄ‬Ĥ‫ڎ‬ƫ Ć‫ڎ‬Hƫ‫ڜ‬Ô‫ڎ‬ƫ Ć‫ڭ‬Ţ‫ڄ‬ƫ Ž ŏ‫ڄ‬Ê‫ڜ‬Ʒ‫ڜ‬j‫ڄ‬ ȷ‫ڄ‬Æ‫ڎ‬Ÿ‫ڎ‬Ć‫ڎ‬ğ‫ڄ‬ƫ dƫ ę Æ‫ڎ‬Ÿ‫ڄ‬ Bş dƫ Ò‫ڜ‬Ɛş .Æ‫ڎ‬Ÿ‫ڄ‬ Bƫ Ž Ć‫ڎ‬Ę‫ڄ‬Ù‫ڜ‬ƾ‫ڄ‬ ğ‫ڄ‬Ć‫ڎ‬Ÿ‫ڎ‬Û‫ڎ‬(Ò)ƫ‫ڜ‬ ¢‫ڄ‬Ĥ‫ڄ‬Î‫ڜ‬ę Ò‫ڜ‬Ò‫ڜ‬Î‫ڄ‬ä Ĥ‫ڄ‬Ƒ‫ڄ‬Ÿ‫ڜ‬Ʒ .Ć‫ڎ‬Ę‫ڄ‬Ù‫ڜ‬ƾ‫ڄ‬ Å‫ڜ‬Ğ‫ڄ‬Ć‫ڎ‬Ÿ‫ڎ‬Û‫ڎ‬(Ò)ƫ‫ڜ‬ Ž ğ‫ڄ‬Ĥ‫ڜ‬ż‫ڄ‬Ÿ‫ڄ‬Hƫ‫ڜ‬ ¢Ø‫ڜ‬Ł dƫ ę Â‫ڎ‬Dz ş‫ڄ‬Ò Õ‫ڎ‬õ ƙƫ‫ڜ‬Ê‫ڜ‬Ř

Ğ‫ڜ‬g‫ڄ‬À‫ڜ‬(Ò)ƫ‫ڜ‬ ğ‫ڄ‬Ÿ‫ڄ‬Ĥ‫ڜ‬Æ‫ڄ‬Ĥ‫ڜ‬(Ò)ä‫ڜ‬ş Û‫ڄ‬Bş‫ڜ‬Æ‫ڎ‬ƫ Ć‫ڄ‬ş‫ڄ‬Å‫ڜ‬j‫ڄ‬ ø‫ڜ‬z(Ò)è‫ڄ‬Å ğ‫ڄ‬Ĥ‫ڜ‬z(Ò)Hƫ‫ڜ‬ Ć‫ڎ‬Ğ‫ڎ‬Ÿ‫ڎ‬Hƫ‫ڜ‬(Ò)ƫ‫ڜ‬ ğ‫ڄ‬Ĥ‫ڜ‬ğ‫ڄ‬À‫ڜ‬(Ò)ę‫ڜ‬Ÿ‫ڄ‬ä‫ڜ‬ş ğ‫ڄ‬Ĥ‫ڜ‬Ô‫ڎ‬Ÿ‫ڎ‬Hƫ‫ڜ‬(Ò)ƫ‫ڜ‬ Õ‫ڎ‬õ Ž À‫ڜ‬Ţ‫ڄ‬Ĥ‫ڎ‬ƫ Ł(Ò)‫ڄ‬ Ȣ‫ڜ‬è .Bş‫ڜ‬Æ‫ڎ‬ƫ Ć‫ڄ‬ş‫ڄ‬Å‫ڜ‬j‫ڄ‬ ø‫ڜ‬z(Ò)è‫ڄ‬Æ‫ڎ‬Ô‫ڎ‬ Ć‫ڎ‬Õ‫ڎ‬ğ‫ڎ‬Ÿ‫ڎ‬ƫ ğ‫ڄ‬Æ‫ڎ‬Ÿ‫ڎ‬Ô‫ڎ‬ Ž Ĥ‫ڜ‬Ţ‫ڄ‬Ĥ‫ڎ‬ƫ‫ڜ‬(Ò)ì‫ڜ‬r Û‫ڎ‬Ğ‫ڜ‬ę‫ڜ‬Ÿ‫ڄ‬Hƫ‫ڜ‬ ğ‫ڄ‬Å‫ڜ‬æ

[4] Ć‫ڎ‬Hƫ‫ڜ‬Ô‫ڎ‬ƫ Û1979 Û‫ڎ‬Ğ‫ڄ‬Ĥ‫ڜ‬Ğ‫ڎ‬Ć‫ڎ‬Ô‫ڎ‬ƫ ÛII .Æ‫ڎ‬Ÿ‫ڎ‬Ô‫ڎ‬ Û‫ڎ‬Ć‫ڭ‬Ţ‫ڄ‬Ĥ‫ڎ‬ƫ Ć‫ڎ‬Hƫ‫ڜ‬Ô‫ڎ‬ƫ Ć‫ڭ‬Ţ‫ڄ‬ƫ ğ‫ڄ‬ø‫ڄ‬Å‫ڜ‬ę ò‫ڜ‬ƾ‫ڄ‬g Æ‫ڎ‬ƫ(Ò)õ .99

ƖƑĭǸĪƟǄǁƐ

ǦĦǺÔǟ

ƕĭəƑĭƦĭƻǁƐ ƼƥƯǁƐ

ƕĭəƑĭǄĭǀǁƐ ƕĭəƑĭƦĭƻǁƐ ƼƥƯǁƐ

þǐƨƑšyΠɛ !ɟΥ ƼþƯ

l ƑYǋǰɃDŽ

GENERAL NOTICES [illegible]

Quantities and their precision [illegible]

[illegible] 20 [illegible] decimals [illegible] 0.20 [illegible] 2.05 [illegible] 1.95 [illegible] 2.0 [illegible] 20.5 [illegible] 19.5 [illegible] 0.0205 [illegible] 0.195 [illegible].

Temperature measurements and their precision [illegible]

[illegible].

Calculation of results [illegible]

[illegible] decimal [illegible] 1 [illegible] 9 [illegible] 5 [illegible] 4 [illegible].

Solution [illegible]

[illegible].

Solubility [illegible]

[illegible] 20 [illegible] "Part [illegible]" [illegible] 1 [illegible].

[illegible]	[illegible]
Very soluble [illegible]	1 [illegible]
Freely soluble [illegible]	10 [illegible] 1 [illegible]
Soluble [illegible]	30 [illegible] 10 [illegible]
Sparingly soluble [illegible]	100 [illegible] 30 [illegible]
Slightly soluble [illegible]	1000 [illegible] 100 [illegible]
Very slightly soluble [illegible]	10000 [illegible] 1000 [illegible]
Practically insoluble [illegible]	10000 [illegible]

[illegible]

Loss on drying [illegible]

[illegible] 1.0 [illegible]

Constant weight [illegible]

[illegible] 1 [illegible] 0.5 [illegible] ignite [illegible]

Containers [illegible]

[illegible] permeability [illegible]

[illegible] *Well-closed container* [illegible] handling [illegible]

[illegible] *Tightly closed container* [illegible] deliquescence [illegible] efflorescence [illegible]

Protection from light [illegible]

[illegible]

Patents and trademarks [illegible]

[illegible]

[illegible]

Use of trade names [illegible]

[illegible]

Reagents, test solutions and volumetric solutions [illegible]

[illegible] VS، TS، IR، R [illegible]

.167 [illegible]

UNITS OF MEASUREMENT [illegible]

[illegible] *Système international d' Unités* (International system of Units) (SI) [illegible] (CGPM) [illegible].[5] [illegible] SI [illegible] (1960) [illegible]

[illegible] (SI) [illegible] submultiples [illegible] multiples [illegible]

[illegible] decimal multiples [illegible] submultiples [illegible] (SI) [illegible]:

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[5] [illegible] SI [illegible] *A guide to international recommendations on names and symbols for quantities and on units of measurement* [illegible] *The SI for* [illegible] 1975 [illegible] D. A.Lowe [illegible] *health professions* [illegible] .1977

ÅßĒǱ giga	(G)	10^{9}
ÅßĒƞ mega	(M)	10^{6}
ƺŸĒõ killo	(k)	10^{3}
ɄøƥÅè centi	(c)	10^{-2}
ɄŸĒƞ milli	(m)	10^{-3}
ȿÅÒƞ micro	(µ)	10^{-6}
ƺƥÅƥ nano	(n)	10^{-9}
ƺÒĒǣ pico	(p)	10^{-12}

ǦȞǤÛöä Ž ĶƞǼÅƥèä ɄøƥÒä ÛǦȞĦȞÔöä ɭèäƺÕöäȿ ǧÅȜÅȒţä ÛǦĒöÅƥöä ǧäǼǵƺöÅǣ ĘäƺÊöä ȻØŁ ȳäǼÅƥèä Ǵȑƺƥ

:ƂȿǼöä ǦÅȿǻɟä ǿƺƥèǼö ǦǯöÅǯöä

Units of length ǿƺÛöä ǧäǼǵȿ

(ȳ) Äƥƞ meter (m)

(ɭè) Äƥƞ Ʉøƥèà centimetre (cm)

(ɭŸƞ) Äƥƞ ɄŸĒƞ millimeter (mm)

(ɭÒƞ) ÄƥƞȿÅÒƞ micrometer (µm)

(ƅ) Äƥƞƺƥƥ nonometer (nm)

Units of mass ǦŸƥÒö ǧäǼǵȿ

(ƞŸõ) Kilogram (kg)

(ȟ) ȳäÅȡ gram (g)

(ƞŸƞ) ȳäÅȡ ɄŸĒƞ milligram (mg)

(ƞÒƞ) ȳäÅȡ ȿÅÒƞ microgram (µg)

(ƞƥ) ȳäÅȡ ƺƥÅƥ nanogram (ng)

Units of volume (capacity) (ǦȞĒö) ɭǱΣä ǧäǼǵȿ

^{3}ɭè1000 = (ȯ) Äƥö Litre (l) = 1000 cm^{3}

^{3}ɭè1 = (Ōƞ) Äƥö ɄŸĒƞ millilitre (ml) = 1cm^{3}

^{3}ɭè 0.001=(ŌÒƞ) ÄƥöȿÅÒƞ microlitre (µl)=0.001cm^{3}

Units of time ȸƞÂö ǧäǼǵȿ

ǦÅè year (a)

day (d)ȳƺÅ

ǦȝÅè hour (h)

ǦŌĒȩå minute (min)

ǦĒƥÅǭ Second (s)

ǦĒƥÅǭ ɄŸĒƞ millisecond (ms)

microsecond (µs)

Units of temperature ǥǿäÅΣä ǦǱǿå ǧäǼǵȿ

ƙÅŸõ kelvin (k)

(°ȳ) ǦÅƺÅƞ ǦǱǿå degree Celsius (°C)

Units of pressure ȔßȒöä ǧäǼǵȿ

ȯÅÒèÅǣ ƺŸĒõ kilogram (kPa)

ȯÅÒèÅǣ pascal (Pa)

:ǦòÅʅä ǧɼÅΣä ȒȞǣ Ž ÅȒÅÜ Non-SI ǧäǼǵƺŸö ƂȿǼöä ȳÅŢÅöä ǧäǼǵȿ Ƙȡ ȸƞ ǧäǼǵȿ ĶƞǼÅƥèä

0.69kPa ≈ (psi Ûùùàǹ ŌÒÎǣ Ûȿǘ Ibf/in^{2}) ȜäÅȟ (Ǧòƺǣ) Ì ƥä ŌÒö ǼƥȿÅǣ ǥƺȩ

133Pa ≈ (ĘǦǝà ɭŸƞ Ûmm Hg) ĘǦǝà Äƥƞ ɄŸĒƞ

Units of electric current ȥȳǻȁȶǼȶȍ ǿȃǿǻȶȍ ğǻǽǵș

ƘƓȱǛ amper (A)

ƘƓȱǛ ȖŸĿƞ milliamper (mA)

ƘƓȱǛ ʐǫǻǹ nanoampere (nA)

Units of electric potential ȥȳǻȁȶǼȶȍ ǼȵƧǻ ğǻǽǵș

Ǩǻʐʐ volt (v)

Ǩǻʐʐ ȖŸĿƞ millivolt (mv)

Units of resistance ǴƞșǻǾȶǻ ğǻǽǵș

ȳș Ǜ ohm (Ω)

Units of radioactivity [6] ǦƸǻȀ ì ǫǻ ğǻǽǵș

ȪǻȀȮĿǻǻ8ĿDZ Gigabecquerel (GBq) = 27.03mCi

ȪǻȀȮĿǻ ǻ8Ŀƞ megabequerel (MBq) = 27.03μCi

ȪǻƘȮĿǻ becquerel (Bq) = 27.03pCi

Ƀǿʐȭ Curie (Ci) = 37GBq

Ƀǿʐȭ ȖŸĿƞ millicurie (mCi) = 37MBq

microcurie (μCi) = 37KBq

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[6] ȖȖǻǳ ȤǻȀȞ ğǻǽǵș ǼƸǻȀ ì ǫǻ ǨƠ ȷǻʐǻȝ "ǻǻșǻ ȷǻ ǦȞ Î ţǻ Radiopharmaceuticals" (ǻȚǫǻ ȁȶǻȂǻ ğ 42-45).

PHYSICAL METHODS ƕŭĭəƒĭŘĭƻǁɛ ƼƥƯǁɛ

MEASUREMENT OF MASS [illegible]

[illegible] capacity [illegible] balances [illegible]
[illegible] accuracy [illegible] sensitivity
accurately [illegible] 50 [illegible]
[illegible] 0.1 [illegible] 200-100 [illegible] weighed
0.001 [illegible] 20 [illegible] 50 [illegible]
[illegible] microbalance [illegible]
[illegible]

Apparatus [illegible]

[illegible]
[illegible]
[illegible] (magnetic [illegible]
[illegible]
[illegible] damping device [illegible]
[illegible] beam [illegible]
(aperiodic balance

[illegible] manual placement [illegible]
[illegible] weight –loading [illegible]
[illegible]
[illegible] optical scale projection system
[illegible] datum line [illegible]

[illegible]
counterpoised [illegible] single-pan [illegible]
[illegible] beam
[illegible]

[illegible]

[illegible]

[illegible] Placement of balance

[illegible] leveling [illegible]

[illegible] Checking of sensitivity

[illegible]

[illegible] RECOMMENDED PROCEDURE

[illegible] Checking the stability of the equilibrium position

[illegible] one-tenth [illegible] 0.1 [illegible] 0.001 [illegible]

[illegible] Operation of the balance

[illegible] beam [illegible] pan supports [illegible]

.gÁΛÁÈì ĞΛÅÅĤā ƙQÅÒöäş ĘǩÅĤöä ŞÅģ Ǽz Ûȷäâǽţä ÀΛÀƠ ĞǼ8ā
ŏЧÎöä ȝřş Ǽz .ȷàʐöä ŏÁǣ ÕƠę ȷäÂǽţä ģǿäÀģ ĞDZǿǻ Бŭ ÕÔǩ ɾøǫģ ȷàʐǫè ЧøǪöä ŏÅǼÌɨȷä ȫÀǪǂ ȷŭ Ǽz
Bŭ Ž şŭ ȷàʐöä ĞǼŸƚȝ ŏÅǪǪş .ЖŸƠè Õöǽ ɒÒnǫŭ Å₺ŸõȷäÂǽţä ĞÅõ ÂõÀn Ž Ĩ₺ₒäǻ Ûȷäàşɨȷä ṎÓŏõş Ûȷàʐɬè ВØöä
ȷŭ Ǽz .Ğȝʒʐ̀n ƙQÅÒöä Ɣnɹ̊ģş ĘǩÅĤöä Ģäāʐõ ȷʐÒǩ ȷŭ Ǽz ÛČĞÅÒöä ɒn ŏÅǼÌɨȷä ȟÂøʍǩ şŭ 8ÅŘɬ Ån̨ǼÆȝ ĞƠèÅʌn̨
ÕəāʐÊöä ȷàʐɬ ȷŭ Ǽz .crucibles ğÁÕǩʐĞöä şŭ ȷàʐöä ÀΛǿāʐę şŭ beakers ȧǿäşÆöä Ṏʐn̨ ğÅʌşÅģ Ž ǻāʐţä ȷàʐǩ
ĞNŭ ȝřş ȳÆȝ Ǽz .gǻäÆÊöä ğāǽ ȷàʐöä ÀΛǿāʐę Ṏʐn̨ ÛȳÅÒģüǽ ĘŸ8ǩ ĞǼȝşŭ Ž ĞǼûÀǪÊŧţä ȳÅÊDZɨȷä şŭ gǿÅǼÛöä ȳÅÊDZɨȷäş
.ÅŧȾęʐʐ gÅìÅĠn̨ ȷäÂǽţä ЧøǪÅõ Bǽúǩ ȷŭ ɒÒƐ ŏÅǼÌìŭ şŭ ĞǼəÅŧǼõ ǻāʐn̨
ĞŸΛʐù ĞǼʌn̨à Õòäʐʐ Žş Kǫõ ŏÅȝş Ž (ǨÁŸÊŧţä ǻÅn̨ÀöäÛŴŸʐn̨) Ån̨ ģǻÅn̨ ɒn̨ ģK8ò ğÅǼŧõ ȷàş ÆDZʐǪΛ Ån̨ǼÁȝ
.Ĩģǻʌʐ ũÛn ÆĠĜÊΛ Åư ăØŁş buoyancy ĞΛʐÀÛöä ɾŸȝ ăÀǫűĿõ 8Åõ ÕÒÎä ģǿäÀΣäş Bʐɾä Ù8ÊöäÒ ȯÆĞǪΛ ÆÕʐ ÛÅn̨ Ĩȝʐǫ
.ȷàʐöä ĞöǻÅĤn̨ ÕDZɟ ƙŏÅÎn̨ ȷàşş ÕÒì Bǽ ÀnÙ ŏÅȝş ȳäÆǻǪèÅä ũÛ]ä ăØŁ ŏÅ8ðŭ ɒÒƐ ÛƙQÅÒöä ğāǽ ɒΛäʐţä Ž
.ȝŧDzQΛ ȷŭ ɒÒƐ ǿÅĠą Bŭ Ğöäàq ĞŏÅÎn̨ gÅìÀʐ şŭ Õŧɾä ÀĤì gÅìÀʐ ȳäÆǻǪèÅä ĨΛǿşǻ ɒΛäʐţä ğÅäõ ĞΛìÀĨʐ Ǽz
.ĠèÅn̨ ǻāʐn̨ gÅÛ8n̨ Ĩèşǔǿ ṎŸǪ ȷŭ Ǽz ЧøǪöä Ûforceps ÙęŸn̨ ĞùÅèʐä ȷäàşɨȷä ŏäÆΛŭ Ǽz

DžFĩǂÇ‖ε üFШDŽNj DžFĩǂÇ‖ε huŮsщNj oFDŽШщÚε huŮsщNj ƀFNJTщÚε üFШDŽNj ƀFNJTщÚε Yƒ€ƀΘ huШƀo DžĩĩYɬ

DETERMINATION OF MELTING TEMPERATURE, MELTING RANGE, CONGEALING POINT, BOILING POINT, AND BOILING RANGE

ṎŸǩ gşÅÕǫş ĞΛʐT ĞǼəÅΛÂǼʐ ĞǪǽÅǫ (triple point ĞǼǫŸƷöä ĞÛÕÅöä) Ån̨ gǻÅŧ ЖǼÒǼn̨ÅΛÅǻʐn̨Àǫ ĞǼÕǼÕΣä óÅȾŤÔǫɾä ĞÛÕǫ ÆĤǩ
ĞŸP ɒŧɾ ȷàäʐǩ ĞöÅģ Ž gǻÅŧŸõ ĞΛàÅ8öäş ĞŸəÅÊöäş ĞGŸÔöä óäʐùɨȷä ÁȾŤʐ ȷʐÒǩ ЧøǪöä gǿäÀΣä ÅŒüä 8ÀĤǩş .gǻÅŧţä
ĞDZǿǻ ÁÆȝ ȷàäʐǩ ĞöÅģ Ž Ån̨ gǻÅŧ ÕəÅÊöäş ÆŸÔöä ȷäóʐÛöä ȷʐÒΛ ЧĤǼGÛöä Bʐɾä Ù8ÊöäÒ ǨÒş .ĞÕŸ8ɦş ĞqĶÀÅɦ
– ÆŸò òʐHǪöä gǿäÀģ ɾŸȝ Ù8Êöä ğäKǫüǩ ȷʐÒõ ĨÂŢǫ ÛɒÒõ ĞǼǫŸƷöä ĞÛÕÅöä ɒȝ Ån̨ Ágş Бŭ ĞÁŸǪƯ ȷʐÒǩ gǿäÀģ
.(◦ȳ) Celsius âʐΛÂŸè ĞDZǿǻ ɒn̨ Ğåţǻ ɒn̨ ŏäÂDZü ĞĤÊRā ɒȝ ÛĨn̨ʐŧȝ ÛÆΛÂΛ ɾ 8ŸǪnɾä ăØŢʐ ÛĞŸǼŸę ÕəÅè
Ṏöǽ ÕDZü ɒn̨ Bǻ̊ÅǼǪȝɾä ŏäÀDZqäş .ÁÕĤn̨ àÅŢDZ ȳäÆÁǪèä ÆŸÛǪǩş gÆŢDzɦ ĞǼǫäāʐǪöä óÅȾÔǫɾä ĨÅÕǫ ƙǼĤǩ ȧÀù ĘǼĤǩ
ĞĤĤĤţä óÅȾÔǫɾä ĨÅÕǫ ZŸǪơ ăØTş .ĞǼǫäāʐǪöä ȧÀÛöä ɒn̨ ĨɾÆä ĞǼÒǼn̨ÅΛÅÆöä ȧÀÛöÅä ĻǪΛ óÅȾÔǫɾä ĨÅÕǫ ÀΛÆÕǪǪ ô À8öä
8ŸǪnÅäş ĞÕĞÛţä ĞÕΛÀÛöä 8ŸǪnÅä 8ȧÀUɾä ?Ém̨ ZŸǪΣş .ĞÕʐāʐţä ĞǼǫŸƷöä ĨÅÕÅöä ɒȝ ЖəÅÔģŭ ĘǼǪĤn̨ ÕÒÎä ăØÒŁ
ĨÅÕǫ ȷʐÒǩ Ån̨ gǻÅȝ .ÒHÅöä ÆǼę gǻÅţä 8ŸǪnÅä ɒÒŧţä ɒnş Û"melting point óÅȾÔǫä ĞÛÕÅõ" ÆŧǪĤţä óÅĘĤţä
ĞÊǼÕǪţä ĞǼÕǼÕΣä óÅȾÔǫɾä ĨÅÕǫ ɒȝ gÆģäş ĞDZǿǻ ĞāäÀę ɾŸȝŭ Бşǻ̊öä ĞΛşǻ̊ɟä ózǪèÆö ĞΛÀĤÎöä ĞÕΛÀÛöÅä ĞÆĤĤţä óÅȾÔǫɾä
.ЖÒǼn̨ÅΛÅǻʐn̨ÀǩĘǼÊǼəó ĞΛózǪèÆöä ğÅÀòäʐţä Ž (óÅȾÔǫɾä gǿäÀģ ğÅDZǿÆä ÕÕģr ǨǼȝǻ̊ ЧøǪöä) óÅȾÔǫɾä ĨÅÕǫ ƙǼĤǩ ȳÆÁǪÊΛ

[illegible]

[illegible] melting range [illegible]

[illegible] apparent constants [illegible] reproducibility [illegible]

A. [illegible]

Determination of Melting Temperature and Melting Range of Pulverizable Substances

[illegible] corrected [illegible] *melting range* [illegible] collapse [illegible]

[illegible] "melting range *a-b* °C [illegible] *b-a* [illegible]" [illegible]

[illegible] *melting temperature* [illegible]

Apparatus [illegible]

[illegible]

[illegible] Silicones [illegible]

[illegible]

[illegible] 360 [illegible] 10 [illegible] 0.8 [illegible] solid-stem [illegible] safety [illegible]

[illegible] *total-immersion-thermometer* [illegible] liquid column [illegible] *partial-immersion thermometer* [illegible] emergent liquid column [illegible] emergent-stem [illegible]

[illegible] borosilicate [illegible] 0.15-1.10 [illegible] 1.1-0.9 [illegible]

[illegible] [7] [illegible]

[illegible] RECOMMENDED PROCEDURE

[illegible] 24 [illegible]

[illegible] 3 [illegible] 5 [illegible]

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[7] [illegible] 263 [illegible] 69 [illegible] Box 3045, S-171 03 solna, sweden [illegible]

Apparatus ŖFNJWWIIƐ

ĞŸäæÅÕöä åäzŧŸö øÅƬÔǫʀä òÅfş øÅƬÔǫʀä gøäÀǵ ĞDZøåå kŒĦǩ ÕDZj A ǨƠ 8zòzŧŸö ¢äÅÎɳ àÅƬDZ ÿäÆÅǪèä Æz :ĞŒöÅǪöä ğ ¥ΛÆĦǪöä 3ɳ øäøæRò Ükåʢǩ öÅ3ş Ž öÅŧʇä ÿäÆÅǪèä Æz – Ü°ȳ100+ Бŭ 10– dɒɳ òÅÖä ĞŒùzǤŖɳ ÈŒÕʇä gøäÅΣä ĞDZøåå âÅŒÕɳ ΨÛ8Λ jŭ Æz – dɒɳ ǩgzǪÅɳ jzÒΛ jŭ ÆDZzǪΛ dÒö A ǨƠ Ğzzòzʇä ÅƬÊÅǫ åÅĦäjä ΨDZÅDZÂöä ΒÀĦÎöä āzǤǫǪò jzÒΛ jŭ Æz – .ĞÀŒö ĞŒDZÅDZà ĞΛÀĦì ÆŒäÅɸŭ ÿäÆÅǪèä dÒǫ ÜkǪΛÅƬÀöä

RECOMMENDED PROCEDURE Nhu Ǐ Ţ Ädž!f CfƧɳÚf

ĮŸɳ 10 ĞääÀę ɔøǪg ÕəÅÊöä ÒǪɛ Ż ÛĞÅÒư gøäÀg ĞDZøåå ŖÅnüæ gåÅʇä ÀƬÔǩ ÛgşåÀzǧä Ž Õöáé Kd dɒĦĦΛ B Åɳ gşåÅzjä ğåÆg Åɳ äæŭ .Ğ3Åè 24 gÆɳ ŖÅnŭ şŭ ȳ10 gøäÀg ĞDZøåå ɔøǪg üGĦʇä āzǤǫjä åƎΛ .ΒÀĦÎöä āzǤǫjä Ž Kd gåÅʇä Õnäåå ¢ĦzÆæ ΒÀĦÎöä āzǤǫjä Qŧł ÛgåÅŧŸö ĞÕĞÊɳ Ğäääŭ Jşå øÅƬÔǫʀä gøäÀg ĞDZøåå kŒĦǩ Æz ¢ǫüæ âÅŒÕɳ 3ɳ āzǤǫjä ÙæÀΛ .kŒĦǪöä àÅƵŭ dÒǫ ÓəÆÅ3 .¢Œz øzÎŢ ĮŸɳ 10 ĞääÀę òzÛæ åzŧ3 ÕÒÎǪŒè äØÒŁş gÀƬÔÅʇä ΒÀĦÎöä āzǤǫQǫ ɔŸÅÊöä ĞΛÀƬÅöä JzÒǩ QŒШ Ànŭ ðƱÌ Bŭ şŭ ƱùÅÛɳ ÎÅäø gÆ3ÅÊɳ ƱəÅʇä ÿÅŧΣä Ž gøäÀΣä ĞDZøåå 20 ĞääÀę ðÅʇä ƤzǪÊɳş āzǤǫQǫ ɔŸÅÊöä ĞΛÀƬÅöä kæ ĞzÅÊʇä JzÒǩş ÛgøäÀΣä ĞDZøåå âÅŒÕɳ ĞŸÔæ Ζ ÔǪΛɳ Ƥz ǪÊɳ ɔŸ3 Õęŭ gøäÀg ĞDZøåå ÆΛ3 ÛgøäÀΣä ĞDZøåå ţÅÀkøä JzÒΛ QŒШ kÅÊǪöä ĮʇΛΛ ÛÀŧǪÊʇä ÕΛÀHǪöä 3ɳ ÿŧΣä dɒÅÊł .ĮŸɳ .ĞÕŒęå 1 Õõ (°ȳ1) gÆgåş ĞΛzÅɳ ĞDZøåå ĞäääÀę ÛĞĦęzǪʇä øÅƬÔǫʀä gøäÀg ĞDZøåå dɒɳ °ȳ5 øæ

ǫʃFDŽWWŒÚɛ huƱsœ DžĩĭyfI .C

Determination of Congealing Point

Õöáé ÅƬŧz ÆäÔǪΛ ΨøǪöä ɔŸ3jä gøäÀΣä ĞDZøåå ΨŁ ÀƬÔʰɳ ÆŸò ĮÊDZ Bj şŭ ÒəÅè Bj åÅŧƵʀä ĞÛÕǫ jŭ ÛÆŸÔöä ÕÒÎöä øÅƬÔǫä gøäÀg ĞDZøÆõ ÅƬÊÅǫ ΨŁ ÕəÅÊöä ÒÒÎöä åÅŧƵöä ĞÛÕǫ jŭ .ÀƬÔʰʇä ĮÊɛä Õöáé şŭ ÕəÅÊöä ĞÕΛÀÛöä ȳÆÁǪÊʰz ÛÆŸÔöä ÕÒÎöä æÅơä ɹşå ¢åÅŧƵöä ĞÛÕǫ dɒɳ ɔøǫåŭ Бŭ gøäÀΣä ÆΛƎk dÒǫ ¢ǫŭ øÅGǪ3Åæ dÒö .ÀƬÔʰɳ ÆŸò Bj şŭ ÒəÅè Bj åÅŧƵʀä ĞÛÕǫ kŒĦǪö ¢Åǫåŭ Ğzzòzʇä

Apparatus ŖFNJWWIIƐ

ĞĦÛę gÆ3ÅÊɳ ĘŒĦʰɳ ÛĮè10 ĞääÀę òzùş Įè 2 ĞääÀę ΨŸnäå ÀÛę Bæ øÅGǪnä āzǤǫŭ dɒɳ ÆèÅʇä àÅƬɔä ɹzÒΛ ÆŁŧθ ǰΛÂɳ şŭ öÅʇÅæ özŸư öÅ3ş dɒɳş ÛĮè 12 ĞääÀę òzÛæş Įè 3 ĞääÀę ÀÛÕæ ÛƎõŭ āzǤǫŭ Õnäåå Ğäzǒǰɳ kŸz .ĞŒùzǤŖɳ ÈŒÕʰɳ gøäÀg ĞDZøåå âÅŒÕɳ dɒɳş ÛÆèÅʌɳ

RECOMMENDED PROCEDURE

dn Ĥ 10 ş ÛÕaÊöä dn Õn 10 Gää Ş Uşş ÁäÆöä óGQnr ā zGq Ž 3r z Ûgş ÅzĝÅ Ž Õöæ Kd dĦĤ B ån ĞDZóå ɔøQg ÆèGn ÆĿtθ ǰ Ân Ž ş öÅţ Ž ĦĤn UDZóGÅ ţäż zGqj å ∃Ħş ĆóGQnä ßäÀţ ÛÀƬÔÅţ ÆŸÔöä ÛÆG ɔøQg ZÛŸæ gøäÀΣä ĞDZóå âÆÕn gÆ3ÅÊn ÕaÊöä öÀ3 ÜÕaÊŸö ĞĤęzQţ ßÅtʊrä ĞÛÕq dn °ȳ5 øæ Õęİ gøäÀg gøäÀΣä ĞDZóå ɔÕGk Åţİù ÛÆŸÔöä ózÛöä ÒÒÎQ Åţİù ÛØaÆA3 .gøäÀΣä Ž Uzó Æk îzGĿ ĞäÆGöä Ž õÅĿş .ÆäÔQöÅæ ÛÆG B äæÛ .ßÅtʊrä ĞÛÕq UĿ ĞşzHŸţä ɔŸ3jä gøäÀΣä ĞDZóå ∃QĦ .ĞQäÅQ GÔk jÛ ÕĿęç 3ÅkÀk şÛ Ķęzöä ÀĦGö ĞQäÅQ ÕaÊöä Бİ gßÅţä dn gK8ò gózŸæ ĞzÅràæ ÆtDzQöä ÀΛÀƠ dÒȣ ÛĞĤęzQţä gøäÀΣä ĞDZóå dn °ȳ2 dtr ÆtDzQÅæ ÕaÊöä .gøäÀΣä ĞDZóå âÆÕn ā zGqQ ĞĒŸnäÆöä jäóÆɔä ĻÕШ şİ

DžƑĭ‡Ɇ hUʼsʑ Džĩĭyŧ .**D**

Determination of Boiling Point

ÅnÆA3 UĦEGù BzDZ Ù8r ĶƠ ÕaÊöä Õöæ ÅƬŹz UŸ8Λ UøQöä ĞHUĦÔţä gøäÀΣä ĞDZóå UĿ ÕaÅè Bj jÆŸ8öä ĞÛÕq .CÅqåÛ Ğzzòzţä ĞÕΛÀÛöÅæ dĦĤŧ

Apparatus ĶFNJШШƐ

ÛgøäÀΣä ĞDZóÆö âÆÕnş ÛgøäÀHUŸö óÆÔnş ÛÆèÅÅţä ÕaÊöä Bz3 öÅ3ş dn kĦĤQöä ÕDZj ÆèÅÅţä àÅƬɔä jzÒQΛ Ånjä ÆŸÛQΛ ÜóäóæRȯ ĞŸæÅÕöä åäzŧŸö óÅƬÔqrä òÅfş óÅƬÔqrä gøäÀg ĞDZóå kĦĤk ÕDZj A ĶƠ 8zòzn zĿ Åtõ āzGqİş ÕtĦQÊţä àÅƬDzŸö ļəŸn òzùş ļŸn 4 Gää UDZóÅn ÀÛÕæ ȝÅDZÂöä dn ĞÕĒęó jäóÆDZ äæ óÅGQnä āzGqİ ĦRΛİ ļŸn 2 Gää ɔŸ3 óÅƬÔqrÅæ ¢ęŸdİ Æz BÓöä ÛļŸn 1 àşÅDzQΛ r UŸnäå ÀÛÕæ ȝÅDZÂöä dn ĞÕĒęó jäóÆDZ Bæ BÀĦÌ .ĞΛÅƬÅöä dn

RECOMMENDED PROCURE

āzGqjä 3rz .óÅGQnä āzGqİ Бİ (ÆŸÔöä ÆõÀţä dn ĞöåÅĦn ĞĿtõ şİ) ƎQÁţä ÕaÅÊöä dn ğäÀÛę 4-3 ÕÕĦł jzÒk ÕÒÎæ kÁÊQöä ȳÅþ Õnäå óÅGQnrä āzGqİ ÕnÆAş óÅGQnrä āzGqİ Ž (ÕÅèQ gózƬÔţä ĞÅƬΛöä) BÀĦÎöä ĞDZóå Бİ ĶæÅQ ÕΛÀƠ 3n ĞȝÀÊæ ȳÅtΣä dÁÊł .gøäÀΣä ĞDZóå âÆÕn ĞŸÔæ ZÔQΛn ƤzQÊn ɔŸ3 ɔŸÁÊöä ¢QΛÆ 2- óäÆÕn gøäÀΣä ĞDZóå ţÅÀkøä jzÒΛ ĻĿΤΛ kÁÊQöä ļĻΤΛ ÓəÆA3 ÛĞĤęzQţä jÆŸ8öä ĞÛÕq dn °ȳ10 GääÀÕæ Õęİ gøäÀg ÀğõİŻ ĞΛäÆGöä Ž ĞÅĿÛæ BÀĦÎöä āzGqQ ɔŸÁÊöä ĞΛÅƬΛöä dn āÀő ğÅ3ÅÕz kÁÊQöä öÅAQİ ÛÆGk .ĞÕĒęå 1 Õõ °ȳ1 ÀäÁł Ż óÅĿQŸö ĞöåÅĦn Ğ3ÀÊæ ğÅ3ÅÕAöä ÅƬŹz ĘŸÛÂk UøQöä gøäÀΣä ĞDZóå ÛÀÕł .jÆŸ8öä ĞÛÕq dn ĶæÀQęä ÅtŸõ Ğ3ÀÈ àŸÛqä ÅŁÆA3 ZęzQΛ UøQöä gøäÀΣä ĞDZóå ÛÀÕł .ĞÕĒęå 1 Õõ Ž °ȳ2-1 óäÆÕn ȳÅtΣä gøäÀg ÀÁÅk ĻĦШ kÁÊQöä

emergent- [illegible] stem [illegible] 670) [illegible] 101.3 [illegible]

$$k\,(p - p_1)$$

[illegible] barometric [illegible] p [illegible]

[illegible] p_1 [illegible]

[illegible] k

[illegible]

p ([illegible]) = 101.3

k = 0.3 ([illegible] 1 [illegible])

[illegible]

p ([illegible]) = 760

k = 0.04 ([illegible] 1 [illegible])

[illegible]

[illegible]

Determination of Boiling Range (Distillation Range)

[illegible]

Apparatus [illegible]

[illegible] receiver [illegible]

[illegible] 60-50 [illegible] 12-10 [illegible] side-arm [illegible] 16-14 [illegible] 12-10 [illegible]

.ČĞęÀĂŸö ŘȦnɉă ĮÊÕöä ʒɳ ČDZǿåˆ 75-70 ǿÆÕæ ČȦşãà ₥ȲÒÎɳ ČĞęÀĂŸö ɔÛèʒöä ČÛÕÁöä ÆȦʒ ÙĞkÀɳ ÛĮŸɳ 5 ĞæäÀęˆ ȕŸnäåˆ ŏȦŧŸö ÒŒŧę ʒɳ Įè60-55 ¢ȯzù gǿäÀHuŸö ȳşȦÕɳ ʒȦDZà ɗɳ ţzȦÔɳ ÛĮŒÕǪÊɳ ȕDZȦDZà ZɣǾɗɳ Ȧɳů ZɣǾȮă ɹzÒȹ ZɣǾŧŸö ɔŸAÊöä ĞȦȦ₮Ȧöä ɹzÒǩ ɹů ɗÒɛ .ĞȦzȦÒɳ ZŒǾǩ ĞĤè ¢ö ÀnÙ ĮŧÔǩ ɗɳ ZɣǾɗɳ şů ÛĤĞȹÀÕǩ Įè 40 òzÛæ .ŏȦǪů ā zĞɋũõ ȳÆÁǪö ȦȾĤɳ bent adapter ĞŒHuȹɳ Ğɳɋ̃ŵ ĘŒŸĤǩ ɗÒɛ şů Ûdelivery ŏȦǪů ā zĞɋů ȕÛĤǪö ĞŒHuȹɳ .Ōɳ 0.5 ĞĞǩó ɗɳ ğȦzǿÆǪæ ČDZǿÆɳ Ōɳ 50-25 ÈŒÕǩ ĞŧùşÀƯ ĞɋzÛèă ɗɳ receiver ŌĞÕǪÊŧă ɹzÒǪȹ ȕəȦæÀȾõ ɗ₪ÊĤɳ şů ÛBunsen ɗȹÂøȦæ Ùy ɗɳ ɹzÒȹ ɹů ÔŘȦł ÛK8ò ȕDZȦDZà ÆŒȾĤɳ ɗɳ gǿäÀΣă ǿÆÔɳ ɹzÒǪȹ ɗɳ ţǿå ʒȓzȹ ÛàȦ8öä ÆŒȾĤɳ ȳÆÁǪèă Ȧɳ ääů .àȦ8öä ÆŒȾĤɳ ʒɳ ɗÒŧŧă ÕöÓö ¢æȦÎɳ ÕȹÆĤǪŸö ÕæȦę ɔÛ8Ĥɳ ɗ₪ÊĤɳ şů ÛĮŸɳ 7-5 ĞǪȦÁĞæ ÛĶĔŧèĚů ĞĤęǿ ɗɳ ţǿÆöä ʒȦÔȹ .¢ǩÆʒȦę āÀę ÛĞŸDZzΣă òzǧ asbestos (ĶǪȦĒĤɳă) ĶĒɢèɉă ʒȓzǩ ȦɳÆȦʒ ¢ǪŮ ǪŒШ ĶnɉăÀÛę ɹzÒȹ ɹů Æz .ÂõÀŧă Ž ÆÕǫ ğäæş ɮè 16-14 òzÛæ ÆǪæzDZ ğäæ ʒæÀĤɳ ÕÒÎæ .Ōɳ 4-3 ğäæ ĞĤè ĶĒɢèɉă ĞĤęÀò ȾzŸĤöä ǴÛÊöä ɗɳ ɔøǪåɉă ĞŸDZzΣă ĮÊÕö ɹzÒȹ Û¢ŸnäåˆĞŸDZzΣă ĸŒĤǩ ÕDZɉ A ĶƠ ȣzòzɳ zŁ ȦŧõˆĮŸɳ 100 ǿÆÕæ ȕəÂɔă ÈÛ8öä ÕDZɉ gǿäÀΣă ĞDZǿåˆ âȦŒÕɳ ĶŒĤǩ ÕǪȦł ÈÛ8öä Ȼć gǿäÀΣă ĞDZǿåˆ âȦŒÕɳ ȳäÆÁǪèă ɗÒɛ ɾŮş ÜǿäǿæŸö ĞŸäȦÕöä åäzŧŸö ǿȦȾÔǪɾă òȦfş ǿȦȾÔǪɾă gǿäÀǧ ĞDZǿåˆ Ûʒęzŧăˆ Ž gǿäÀΣă ĞDZǿåˆ âȦŒÕɳ ʒȓzȹ ȦɳÆȦʒ .emergent-stem correction ĘŽĞȦŧă ţØDzŸö ÆèȦȦɳ ĞŒHuÔǩ ʒɳ ȕŸÒöä gÆʒȦę ɗɳ ɔøǪåÜ åȦÒöȦæ bulb ČŸÔĞöä Čŧę ɹzÒǩ ɹů ÆzŞ ÛĞŸDZzΣă ĞĞęǿ ÂõÀɳ Ž stem ţǿɔă ʒȓzǪȹ ɹů Æz .ƑǪȦɔă ÆʒȦÊŸö ǾĠȦŧă

RECOMMENDED PROCEDURE Nћ Ǐ Ţ Ădž!ƒ CƒƧɳÚƒ

Ž òzɲÆöȦæ ÕəȦĮÊöä ɗɳ ĞŒŧõ Ƀj dzȦŧĮÊöä ȳÆĤæ ĞȦȦAĤöä ȕɲzǩ ʒɳ ÛƎǪÅŧă ÕəȦĮÊöä ɗɳ Ōɳ 25 ĞŸDZzΣă Ž ʒȓzȹ ğäǿȦÆǩ ÁȓˆĞŸDZzΣăş ÆŒȾĤă ţǿÆȹ .ĞŧəŸɳ gÅȦɳ ĞȹÙ şů ȜȦDZÂöä ğÁĠŒğ ɗɳ Ňo.5-0.3 ȣȦŘȹş ÛƑǪȦɔă ÆʒȦÊöä gǿȦÛÕöä ɗɳ gÀÛę òşů îzÕè ÕĞę ĞÕŒęÅ 10-5 òŸɲş ĞŸDZzΣă ĞĞęǿ Ƃ₪ÂÔğ ₪ÆÛæ ǿȦÁĞöä ʒȦǩÀȹ ǪŒШ ɗ₪ÁÊŧş ŏäzTă ÙÕÊǩ ȦɳÆȦʒ gǿäÀΣă ĞDZǿåˆ ÙÀÕŀ .ÕĞÕǪÊŧă Ž gǿȦÛ₪öä ʒŧθş ÛĞÕŒęÅ 1 Õõ Ōɳ 3-2 òŒĚĤɳ ĶÛÕ₪ǪöȦæ Àŧǫ̈ÊŀŀˆZɣǾŧă ɗɳ ĞĞÊȦöä ÀÛÕǪǩ ȦɳÆȦʒ şů ĞŸDZzΣă gÆʒȦę ɗɳ ÕəȦÊöä ɗɳ ĞŒŧõ ȺnÙ ÀÁĞǪǩ ȦɳÆȦʒ ĞŒǪöȦæ ÙÀÕŀşˆ ÛZɣǾŧă ɗɳ Ƃşɉă gÀÛÕöä .gÅÆŦă ĞȦzȦŧă

Ƃzɔă Ù8Röä ĶƠ ğäşÅÀzǧă Ž ȦZŒÙů ǿȦÎŧă (distillation ranges ĶÛÕ₪öä ğɾȦf) ɹÆŸ8öä ğɾȦf ĘĞÛǩ ğäõäÀę ÁĦÒŀ ÛÀnÙ ƂzDZ Ù8ř ĶƠ ĸŒĤǪöä Ź ȦɳÆȦů .(ĘĞəà ĮŸɳ 760) (Kpa) òȦÒèÆæ zŸŒõ 101.3 (ƂÀ₪ǫşǿȦĞöä) ĮŸɳ 2.7) òȦÒèÆæ zŸŒõ 0.36 ÕÒö ◦ȳ 0.1 ÒŒÔÁǪæ Ƃzɔă Ù8Röä Ž àȦz Ƃů ÕDZɉ ĞşzHuŸţă gǿäÀΣă ğȦDZǿåˆ .ɔŸʒů Ù8Röä ɹȦõ ääů dzÀÛł şů Ûƀåů Ù8Röä ɹȦõ ääů 8ȦŘł ÛàÀÀŸö (ĘĞəà

[illegible]

DETERMINATION OF MASS DENSITY AND RELATIVE DENSITY

[illegible] (Q) [illegible] .cubic meter [illegible] 1 [illegible] (SI) [illegible] 1 [illegible] 1 [illegible] reduced to vacuum [illegible] buoyancy [illegible] (Q_{20}) °20 [illegible] .(conditions [illegible] °20 [illegible] (d_{20}^{20}) [illegible] specific gravity [illegible] "d_{20}^{20} [illegible] ."°20 [illegible]

[illegible] °20 [illegible] d_4^{20} [illegible] 0.998234 [illegible] °20 [illegible] .°4 [illegible]:

$$d_4^{20} = 0.998234\, d_{20}^{20}$$

RECOMMENDED PROCEDURE [illegible]

[illegible] hydrostatic [illegible] d_{20}^{20} [illegible] . pycnometer [illegible] (g/ml [illegible] kg/l [illegible]) Q_{20} [illegible]

$$Q_{20} = 0.99703\, d_{20}^{20} + 0.0012$$

Use of pycnometer [illegible]

[illegible] plummet [illegible] .beam [illegible] riders [illegible]

[illegible]

Use of pycnometer [illegible]

[illegible] 5 [illegible] 20° [illegible] mark [illegible] 30 [illegible] 20±1° [illegible] inter [illegible] 20±1° [illegible] (d_{20}^{20}).

[illegible]

DETERMINATION OF OPTICAL ROTATION AND SPECIFIC ROTATION

[illegible] optical activity [illegible]

optical rotation [illegible]

[illegible] dextrorotatory [illegible] (+) [illegible] (−).

[illegible] (*a*) [illegible] angular [illegible] (SI) [illegible] radian (rad).

[illegible] D (sodium D line) [illegible] 589.3 [illegible] 589.0 [illegible] 589.6 [illegible] 546.1 [illegible]

[illegible] photoelectric polarimeter [illegible]

[illegible] 25-20° [illegible]

[illegible]

Specific optical rotation (specific rotation) [illegible]

[illegible] 100 [illegible]

[illegible] 100 [illegible] 1 [illegible]

$$\frac{10\,000}{ldp} = \frac{10\,000a}{lc} = \text{[illegible]}$$

[illegible] c [illegible] l [illegible] a [illegible] 100 [illegible] p [illegible] d [illegible] 100 [illegible]

[illegible] λ [illegible] t [illegible] $[\alpha]^t_\lambda$ [illegible] (SI) [illegible] m²·rad/mol [illegible] (a_n) molar [illegible] m2·rad/kg [illegible]

Apparatus [illegible]

[illegible] polarimeter [illegible]

[illegible] 0.05° [illegible] 0.01° [illegible]

[illegible] visual [illegible]

.ÆèÅŋţå ǒzRöä ǿÉÔŋ ĞŐŸĤǪţå ƷǂÔţä ğÅŧŁŒŸĤǩ ţÅĞķä Æzş .mercury-vapour lamp ŲŐĞəÂöä ǿÅÁĞöä dzÅĠÔŋ şŭ ƁÀÔĞöä ÀʌşÆǪöä ƙŒĤǪö ĞʌåÀÀöä gåşÀzģ̈å Ž ƙķʌ ÅŋÉÆȝ :photoelectric ĞŁəzȒÀŲŢǪöä ãÅÛŐǪèŗå ÈŁʌÅŐŋ .0.01° ȸȝ ŐŐǩ ŗ ĞŒùzĠRŋ ãǽ Ųəz ȒÀŲŢõ ãÅÛŐǪèå âÅŒŐŋ ÔŧĤǪÊʌ ÛĤŁəzȒÀŲŢõ

Measurement of optical rotation ăþTĠℓℇ þĩÑjǫĦℓℇ Ƨ ƒĩƽ

.ĞŒŐÅǪöä ğåǿÅǪȝŗå ÆÊŰŰ ÅŁàÅƠŮ Ź Åŋ åæŮ ƁÀÔĞöä ÀʌşÆǪöä ğÅèÅŒŐö ĞęÉöäş ĞŒùzĠRţå ǻäåÂǩ ȸbŋ ĞĠʌÀę ȝùÅŐǪöä ĞÛŰŐǫ ȝŐǩ ȷŮ ÆzŞ ĘŒęǻ alignment ŽÅÔǩǿä Ùn Ž ĞŐöüǪŋ ĞÁŒŢǫ gäǻŗå ÀÒÅȝ ȷzÒǩ ȷŮ Æz ÆzŞ .optical bench ĞʌÀÔĞöä ĞƠÅţå ȝŋ ZÔǩÀʌş ŰǪæÅǫ ǒzRöä ǿÉÔŋ ȷzÒʌ ȷŮ Æz .ŲĤŒĞÛöä ÀÀÔöä mark ĞƧş .ąƱÅõ ŐÒÎæ monochromatic ȷzŸöä ĞʌåÅǵŮ ĞĤŒĠù Ɓǽ ǒzŗ transmitting ĘʌÀǪ ɔŸȝ ǿåÅę ÁŒÌÀǩ ȳÅŢʌæ åʂÂł ȷŮ şŭ ȳzʌåzÔöä ǒzŗ ȸbŋ ᴅ (ţÅĤÎöä) ÙǀåÒÅĤǒ gĸ8ǫŋ îäÅęŭ ȝŋ ZŰÒǪǫ ĞŐŒęÉöä ãÅÛŐǪèŗå ÈŁʌÅŐŋ ǀŧÔǩ ŋzŧȝş ÛŐÒÒÎöä äØǒ ĞŧŧÔħ ǨÊŒö ãÅÛŐǪèå ÈŁʌÅŐŋ ȝŋş .ĘĠəÂöä ZŒù ȸbŋ ÀǫnzǫÅǫ 546.1 ĞDZzţå òzù Ɓǽ (ţÅĤÌ) Ùn .ÁÌÌäÀŧõ ĞĠèÅʌŋ ĞǫzŸŋ Ôəäzè ƁzƠ (ʌÌ¥n) ğäĸDzǵ ÿäÉÁǪèå ȸÒŧŒz

Ûāǿʌθ ĞǫŸǫ ƙæ ȧşÀÀöä ¢Œz ÉʌÂǩ ŗ ƁØöä ƧÆţå Ɓŭ ĞʌǿäÀÒǫŸö ĞŸäÅęş ĞùzĠRŋ ĞŢǵ¥Ţå ğäöäÀŐöä ȷzÒǩ ȷŮ Æz ãÅÛŐǪèŗå âÅŒŐŋ ǰʌǿÆǩ ǀǽè ĸĤŒǪæ ǵĸnǰå ĞŧŒŐöä ŘÊ€ℓ) ÀʌşÉǪŸö ĞŒŐŒÕΣä ĞŧŒŐöäş ĞŢǵ¥Ţå ĞŧŒŐöä ƙæ şŭ .ǿÁǪnŗå ÆŒę ǵåÅţå ÀʌşÆǪö ĞʌåÀÀöä ǵşåÅzģ̈å Ž ɔÛĤţå òÅÖä Ʒǂǿȸȝ Û(ĞĠèÅʌŋ ğʌǿÅŒĤŋ ĞŋÂǵ ǿşÀŋ Ʒŋ ÕnäÆǪǩ ŲøǪöä ÛöäzŁ ğÅƷÅŐz õÀǩ ÅŢz ÆʌDzǫŧ ĞŐʌÀÛæ ãÅÛŐǪèŗå âÅŒŐŋ ÆŁäǫŭ ǪǪ ȷŮ Æz Ʒŋş .gÆǵäş ĞʌÅĊ ȸbŋ ƷÊ℔ŋ ÆŐŸöä ÅŢz ȷzÒʌ ÆŁäǫŭ òÅŧĤǪèÅæ ğÅƷÅŐÅöä ÕnäÆǩ ȸbŋ ɔøǫåǰå ÁΣä Ƃŭ ÕĤŐŧş .ǒzRöä Ûmicro ĞʌşÀÒǫå şŭ semi-micro ĞʌşÀÒǫå ZÔǫ ÆŁäǫǰå ŐŸŋ Ûuniform ǀŢǪÅţå ÆŐŸöä ğäæ ÆŁäǫǰå Ž ÛÕǿé .ĞĠèÅʌŋ güĠĤǩ ÕDZǰ ĞʌÅÅĤöä Ųnzǩ ÆDZzǪʌ

ȷzÒʌ ȷŮ ÆDzŁz ÛĞŒÛqŭş ǨĘĠŸǩ ĞÔʌŋ ɔŸȝ ĞǪĠŸŋ end-plates ĞŒəÅŒ ĠəÅÀò ÅT ŲøǪöä ĘŸ8Ÿŏ ĞŸäÅŐöä ÆŁäǫǰå Ž Ù8Röä ÆĠÊʌ Áęş .ãzǪǰå ǀÊDZş ĞŒəÅŢʌöä ĞHŧÅÔöä ƙæ ãŋÊǩ ǫşÆǵ ƷÅţ ŲÅÒʌ ÒÒÎæ ŋŧÒHŋ ĞŒÛqǰå ȧ¥qǫ gǿÆę ğäæ Åŋ gåÅţ ƁÀÔĞöä ÀʌşÆǪöä ƙŒĤǩ ÁÆȝ .âÅŒŐöä Ʒŋ ÕnäÆǪǩ strains ğäåÅŢDZŮ ĞŒəÅŢʌöä ĞHŧÅÔöä ɔŸȝ îÀÅţå ÀÅÔöä ĞÛŰŐǫş ÀʌşÆǪöä âÅŒę Ž ĞŒŐÅǪǪţå ğäöäÀÔöä ƙæ ĞŒǫÅǫ ÅŁÆìŻ ĞŒÛqǰå ÀʌÀƠ ãzqÅţå ȸŧz ÛĞŘÅÁʌŋ ĠʌÀʌşÆǩ ğ¥ʌÁĤǩ öäÀDZŮ ȸÒǯş end-plate strain ĞŒəÅŢʌöä ĞHŧÅÔöä åÅŢDZŮ ȸȝ ǀDZÅäöä ȧÀÅöä ÀŢŢʌ ÛĞŐʌÀÛöä ĊØŁ Žş .ÅŧŢŒŸõ .ÆĠÊöä ŏÅ8ŏq ĞĠèÅʌŋ

Őõ Ž ÆʌØţå ȸbŋ ĞŒŐÅǀå şŭ ĞŒəÅŋ¥öä ĞÅÅÖä ǵåÅţå ɔŸȝ Ųȝzǻöä ÀʌşÆǪöäş ƁÀÔĞöä ÀʌşÆǪöä ÕDZǰ ğÅĠŸÛǪţå ĘŒÛĤ Ønǰå Æz ÛǰəÅǪöä ãÅÊǵ ÆÅȝ .ÆʌØţå ƧzǪŢ şŭ ŏÅţå şŭ ZŁÅDzǪŐÅæ ÆŐÅöä KʌÀĤŋ ÅŢŢz ɔÛĤĤ ŲøǪöä ǵåşÀzģ̈å .ǵåşÀzģ̈å Ž Ğzzòzţå ĞŐʌÀÛŐÅæ ĠÆĤŋţå ÆʌØţå ƧzǪŢ şŭ ŏÅţå şŭ ZŁÅDzǪŐÅæ ÆŐÅöä ȷÅĠÊΣÅæ

ȷȦõ ãæů Ànů ÆȠØη Bů ş̌ů ŏȺţã ĞùȦèʒã ĞŁtDzǵ ĞŸDZʒǵ Бů ŎŎȻkş ÆèȦȠ ļÊę ȷàʒɬ ÛĞGŸò gǻȺţã Ǩ℘Ȧõ ãæů ş̌ů ŏȺţã ǴÛè ŎȞƨ 8Ȧõ ÆȠØη 8ȦŘɬ .blank ÆŁǺÎïãã ƙŒȞǨ ÔDZȷ ÆȠÓţã dbη ļÊę ɔŎĞ℘ÊŁkş Ûgǻş℘Ăʒǵ℘ã Ž ßǻÆŢ ğȦʒ℘Ţ gǿãÀǵ òŒÉȞŁş Ûmark ĞƧʒïã Ûbǻů ȴŁəäǻ dbÒï Ûdbη ȴGȠÀęmeniscus òŸŁ ŎÒÎƨ gǻȺ3 ȷʒÒʌ ΒÓïã ÆȠÓţã ãʒ℘ůБů òʒŸ∓ã ŎŎȻɬ .ʒÂȾş ÛĞƧʒïã ɔøǾǵ ÆȠÓţã 8ȦŘɬ .ĞǾæÀǾ gǿãÀǵ ĞDZóǻ Bǽ ȳÅþ Ž ĞŸDZʒΣã ĘŒŸȞǾæ ĞŸDZʒΣã ÈŒĒǨ Ž ĞȠÀȠȞĞïã Ʉnʒǩ ʒη Ûgǻ∆ţã ȷ∆æşé dbηà dbη ßǨãÆǾæã ĞŎŒęǻ 30 òŸn Õïǽ ļǾʌ ȷů ŎŘÀʌ Û ãÂÛŎǾèɾã âȦĒŎη Ş ʒȦHɬ .mutarotation òǽĞǾţã ÀȠŞÆǾïã şů racemization ļĖşÀŒŸõ ʒŘơ ȦĞů 8şÀȞţã ǻʒţã ĞïȺǵ Ž àÀ8ǾÊţã dbηÂïïã ĞŸÒÀʒ ŏȦȠǾů ĞæʒŸÛţã gǿãÀΣã ĞDZóǻæ òʒŸ∓ã ɔŸʒ .ãȦÛŎǾèɾã âȦĒŎη ãʒ℘ůБů gÀìȦĞη ŎŎȻkş ÛȠȠóşÀr Õïǽ ȷȺõ ãæů ÛȦőǿãÀǵ òǽȞȦ ÛĞŸəȦè gǻȺţã Ǩ℘Ȧõ ãæů Ôę∆ã ɔŸʒ ğãÀη 6 ŞǵŸţã ÀȠŞÆǾïã ÛÀŎɬ Ûvisual ΒǿȦÔæqã âȦĒŎïã ÔDZȷ ãȦÛŎǾèɾã âȦĒŎη ȳÆǺǾÊɬ ȦηǺÆʒ ÛòʒŸHʊŸõ ɔŎĞǾÊţã ÆȠØţã òÆĞǾÊʌ .ǦʒȦ Êïãã ãǿȦÔʒ ǴÕÀǵ ĞȦΘȦæ ğãõãÀŎïã Ζ℘Ô℘ Ønúɬ .ǦæʒŸÛţã gǿãÀΣã ĞDZóǻæ ȷů̈ş .ȟhóȦʒ 8ȦDZ ãʒ℘ůɯ ɔŸʒ ÆŁǺÎïãã ğȦĒÆĒȞǨ ƧÀDzɬ ÛĞŸəȦÊïãã ǻæʒţã ĞõȦǵ Ž .¢ĒŸʒ ğãõãÀŎïã dbη ŞȦÊη ǻÆʒ ÙÀŎɬş gǿȦìqã dbη ȷȦʦęÀïãã ȷȺõ ãæů ŞǵŸţã ÀȠŞÆǾïã ÛÛèş dbη dzÀÛɬş ÛÆŁǺÎïãã ğãõãÀę ÛÛèş ʒŁ ÀÀÔïã ĞÛŎ℘ ǴŒHʊÔǨ .ǴŒHʊÔţã ŞǵŸţã ÀȠŞÆǾïã ŏȦÛʒů ÔDZů dbη ʒŁ Õïǽ ÔõŞ ÛĞÊõȦĤη gǿȦìů dbη Ȧ℘Ȧõ ãæů 8ȦŘɬ şů ÛȦƵÊA℘ sign âȦĒŎţã Ùy ɔŸʒ ßǻȦʦǾʒã Ûğãõ㪺ÀÔïã dbη Ôę∆ ßǻÆʒ ÀnȷȦã ÆŸÛǾ ÛÛəʒȞÀȠǾÓïã ãȦÛŎǾèɾã âȦĒŎη ȳÆǺǾÊʌ ȦηǺÆʒ .ȳÆǺǾÊţã

DETERMINATION OF REFRACTIVE INDEX þFƨlŒÚƐ ƒłƨŒŽ Džĩĭyɬ

.gǻȺţã ÕŸǩ Ž ¢ǾʒÀè Бů vacuun ŏƳ]ã Ž ŏʒÊïãã velocity ĞʒÀè ĞGÊ℘ ʒŁ Ȧη gǻȦt (*n*) óȦÊÒǾ℘ɾã ÆÊȦη ȷů ¢ØŁ ÆȠÆƠ ΒøşÀÊïãã dbţ ¢ǾǽʒÕĩóş .gǿãÀΣã 8ƳǾnȺæş ¢èȦę Ž ȳÆǺÊţã ŏʒÊïãã ĞDZʒη òʒù 8ƳǾnȺæ Ζ℘Ƨş ÛãØŁ ȷȷ – gǻȺţãş ŏƳ]ã dbη ŒɾÆȺ ÛgǻȺţã Žş ŏãʒTã Ž óȦÊÒǾ℘ɾã âȦĒę gǻȺ3 ļƋƳţã dbţ ¢ǾǽʒŒŸʦʒş .(*n*$_\lambda^t$) îşÀÎïãã .ĞŢǵŸţã ļĖÕïãã ʒη Ββǻ∆Ǿʒã Kǿǩ ¢ĩ ÈĒĩ ÛĞȠóʒǾèǻ ğȦȺ8ĩş .óȦÊÒǾ℘ɾã ĞȠşãà ÆĒDZ Бů incidence ǻşóʒïãã ĞȠşãà sin ÆĒDZ ĞGÊ℘ ¢ǾŸ ɔŸʒ óȦÊÒǾ℘ɾã ÆĒÊȠη ŒŘŒů 8ǾȦŘɬ ŎDZȷ ŒŘů ȳÆǺǾÊŁ ȷů dbÒƐ .ǻǻʒţã ĞȠʒŁ ÆĒùʒǩ ŎDZȷ ĞȠóʒǾèÆïãã ğȦȺ8ĩïã ĞòȦn óȦÊÒǾ℘ɾã ÆĒÊȠη âȦĒę ȳÆǺǾÊŁ .ǻǻʒţã ĞÒŸǾ gşÀÕ℘ óȦǾǾnȺã gǿãÀǵ ĞDZóǻæ (lin D ÙǾ]ã) ÀǾnʒǾ℘Ȧ℘ 589.3 ĞDZʒţã òʒù Bǽ ȳʒȠǻʒÔïãã ŏʒr ĞïɾÆǻ gǻȺ3 óȦÊÒǾ℘ɾã ÆĒèȦȠη dbŒǩ .(n_D^{20}) °ȳ0.5 ± 20

ÆĒÊȠη db3 KĞȞǾïãã gǻȺ3 ΨÀÒȠ ¢ǾǽʒĞȠóʒǾèÆïãã ğȦȺ8ĩïã ÕDZȷş .gǻşÀʒǵ℘ã ğȦĞŸÛǾη âȦĒŎïã ĞŒùʒǤRη ÙĞǩÀǩ ȷů ÆʒŁ

Apparatus

589.3 (D)

prisms

1.330 20°

1.3325 25°

SPECTROPHOTOMETRY IN THE VISIBLE AND ULTRAVIOLET REGIONS

electromagnetic radiation

monochromatic

spectral range

spectrum

(780-380) (380-190)

monochromatic

quantitative

International Pharmacopoeia:

(*T*) 10 logarithm – (*A*) *Absorbance*

ȣắäÀŧõ internal transmission density ĞĔŸǹäǼöä ȯÀÕ̊Ǫɍä ĞʐÃǯõ ǴŸÛÔɦ ÕŧȞǪÊƚ ɟÜ ȡȮɛ .transmittance ŏÀÀÛɸɍäş ÛĞȍÀŧǪöä Ûoptical density ĞǹÀÔŧöä ĞʐÃǯÔöä ǨÕäÀȅ ĞɳǼǺǪÊţä ĞƎÀȍʐöä ğÀȞŸÛÔţä ȡŧȒǪǩ ÛɳÎ ÀŧǪŸö

.extinction

ĝƎǪÂţä ĝắÀţä ȯŸǹ ȡɳ (ǾʐÀÆöä) ȧøÀţä radiant flux ȝÎţä ȨʐǼǪöä ĞĜÊɸ – *Transmittance (T)* *(ǽÀÀÆöä) ȧäÀǪɳɍä*

.transmission ȯÀÕ̊Ǫɍäş transmittancy ĞǺǽÀÀÆöä ǨÕäÀȅ ĞŸŧȞǪÊţä ğÀȞŸÛÔţä ȡŧȒǪǩ .ȝÎţä ȨʐǼǪöä ÕöǽÂ Ƃ Ü

ÀǨȞţä Û(*c*) ĝắÀţä ÂƎõÀǩ ǡÀȓ ǰǩÀɸ ʔŸȝ ǨɳʐÊÕɳ absorbance (*A*) ɳÎ ÀŧǪöä ÕȍÀǵ – *Absorptivity* (*a*) ĞǨȍÀţä

ÀÕƎǪş ɟÀȞŸÛÔɦ ǼǅʐÀ .(ȴȅ) ÀǪɳ ɄøǪÊÕÀǼ ȼÀȝ ÀǨȞţä (*b*) ɪÀÔǪɳɍä øÀÊɳ ȯʐǜ ȝɳ ÛÀǪö 1 Õõ Ž ÿäÀȣöÀǼ ȼÀȝ

specific absorption Ʉȝʐöä ɪÀÔǪɳɍä ÕɳÀȞɦş specific extinction Ʉȝʐöä ŏÀÀÛɸɍä ÀƵ ĞǨȍÀţÀǼ ĞŸÔöä

ÕȍÀǵ ʔŸȝ ÛĞÀşắɉä ƘǩÀȅắ Ž ǨɳʐŧȝÿǼǺǪÊɦ ʐȽ Àŧõ Û($E^{1\%}_{1cm}$) "Ʉȝʐöä ŏÀÀÛɸɍä" ǴŸÛÔɳ ȯǼÀ .coefficient

ȯʐǜ ȝɳ ÛÕɳ100 Õõ Ž ÿäÀȣöÀǼ ȼÀȝ ÀǨȞţä Û(*c*) ĝắÀţä ÂƎõÀǩ ǡÀȓ ǰǩÀɸ ʔŸȝ ǨɳʐÊÕɳ absorbance (*A*) ɳÎ ÀŧǪöä

Ʉȝʐöä ɪÀÔǪɳɍä ÕɳÀȞţ" ǴŸÛÔɦ ȣÀȞƚ . $E^{1\%}_{1cm} = 10a$ äǾÕȽş ÛÀǪɳ ɄøǪÊÕÀǼ ȼÀȝ ÀǨȞţä (*b*) ɪÀÔǪɳɍä øÀÊɳ

Commission on ĞƎəÀƎŧƎȮöä ĞƎəÀÀÂƎÀöä àʐɳÀöä ĞÀƎȽ ÕĞȩ ȡɳ ǨƎəǼĞɳ ǳʐÀǪÕţä Û"specific absorption coefficient

ŏÀƎŧƎȮŸö ƂşǼöä ắÀƠŸö Units ĞƎöşǼöä ğäǼǵʐöäş Terminology ğÀȞŸÛÔţä ȴŸȝş ÛPhysicochemical Symbols

ɪÀŧǪöä ÕȍÀǵ ȼɸÜ ʔŸȝ ÛPure and Applied Chemistry (IUPAC) International Union of ĞƎÕƎĞÛǪöäş ĞÔöÀɿä

ɪÀÔǪɳɍä ÕɳÀȞţ a_{SI} ÂɳÀöä ÿǼÀǺǪÊÀ ÀɳǼȝ Û(*l*) ɪÀÔǪɳɍä øÀÊɳ ȯʐǜ ȝɳ (*c*) ÂƎõÀǪöä ǡÀȓ ǰǩÀɸ ʔŸȝ ǨɳʐÊÕɳ (*A*)

.a_{SI}= 100*a* Û(ȠŸõ) ÿäÀȡ ʐŸƎõ 1 Õõ Ž (²ÿ) ȝǽÀţä ÀǪţÀǼ ĞƎöşǼöä ğäǼǵʐöä ÿÀŢɸ Ž ȼÀȝ ƎȞƚ ɟÜ ǼƵ ɃǾöä ÛɄȝʐöä

ŏÀÀÛɸɍä ÕɳÀȞɦ şÜ absorbancy index ɪÀŧǪöä ÝǼÊÀɦş "absorptivity ĞǨȍÀţä" Ƙǽ âÀĞǪöä ǫǼȝ ɍ ɟÜ ǼƵ

.extinction cofficient

ÂƎõÀǩ ǡÀȓ ǰǩÀɸ ʔŸȝ ǨɳʐÊÕɳ absorbance (A) ɳÎ ÀŧǪöä ÕȍÀǵ – *Molar absorptivity* (ε) ĞǨöʐţä ĞǨȍÀţä

ǰǩÀɸ ȼɸÜ Àŧõ .(*a* = *A*/*bc*) ÀǪɳ ɄøǪÊÕÀǼ (*b*) ɪÀÔǪɳɍä øÀÊɳ ȯʐǜ ȝɳ ÛÀǪö 1 Õõ Ž ğɍʐţÀǼ ȼÀȝ ÀǨȞţä Û(c) ĝắÀţä

molar ƂʐţäɪÀÔǪɳɍä ÕɳÀȞɦ ǴŸÛÔɦ ȣÀȞƚ .ĝắÀŧŸö ɄƎəÂƨä ɟàʐöä ȝɳ absorptivity (a) ĞǨȍÀţä ǡÀȓ

Commission on ĞƎəÀƎŧƎȮöä ĞƎəÀÀÂƎÀöä àʐɳÀöä ĞÀƎȽ ÕĞȩ ȡɳ ȼǼ ʔȍʐţä (Linear ǨÛǹ) absorption coefficient

ĞÔöÀɿä ŏÀƎŧƎȮŸö ƂşǼöä ắÀƠŸö Units ĞƎöşǼöä ğäǼǵʐöäş Terminology ğÀȞŸÛÔţä ȴŸȝş ÛPhysicochemical

ȯÀÕ̊Ǫɍä ĞʐÃǯõ ÕȍÀǵ ȼɸÜ ʔŸȝ ÛInternational Union of Pure and Applied Chemistry (IUPAC) ĞƎÕƎĞÛǪöäş

ȝɳ ĝắÀţä ÂƎõÀǩ ǡÀȓ ǰǩÀɸ ʔŸȝ ǨɳʐÊÕɳ ĝắÀŧŸö (absorbance ɪÀŧǪöä) internal transmission density ɄŸǹäǼöä

ğÀȞŸÛÔţä ȡŧȒǪǩ .ȯʐɳ 1 Õõ Ž ²ÿ øÀǼ ȼÀȝ ÀǨȞƚ ɟÜ ǼƵ ĞƎöşǼöä ğäǼǵʐöä ÿÀŢÀö ǨȞĞǩş Û ɪÀÔǪɳɍä øÀÊɳ ȯʐǜ

ŏÀÀÛɸɍä ÕɳÀȞɳş absorbancy index ĞƎȍÀŧǪöä ƎÊÀɦ molar absorptivity ĞƎöʐţä ĞǨȍÀţä ÕǅɉǨÕäÀȅ ĞŸŧȞǪÊţä

.molar extinction coefficient

– Absorption spectrum

.graphic

.photometrically

Apparatus

.ionization

[illegible]

Spectrophotometer calibration [illegible]

[illegible] calibrations [illegible] photometric scales [illegible] spectral line [illegible] quartz-mercury arc [illegible] 435.83 [illegible] 404.66, 365.48, 334.15, 313.16, 302.25, 253.7 [illegible] parseodymium [illegible] didymium [illegible] holmium [illegible] (neodymium [illegible] 3±536.2 [illegible] 1±360.9 [illegible] 1±287.5 [illegible] 1±241.5 [illegible] maxima [illegible] 241.15 [illegible] holmium perchlorate TS [illegible] 536.3 [illegible] 361.5 [illegible] 278.2 [illegible]

[illegible] %1± [illegible] photometric scale [illegible] potassium dichromate TS [illegible] absorpitivity [illegible] specific extinction [illegible] absorbance [illegible] sulfuric acid [illegible] 1000 [illegible] 60.06 [illegible] potassium dichromate [illegible] 1.000 [illegible] VS [illegible] 0.005) [illegible] A [illegible]:

[illegible] 350 ([illegible])	[illegible] 313 ([illegible])	[illegible] 257 ([illegible])	[illegible] 235 ([illegible])	wavelength [illegible]
0.640	0.292	0.865	0.748	A
0.646-0.634	0.295-0.289	0.874-0.856	0.756-0.740	[illegible] permitted tolerance
106.56	48.62	144.02	124.54	$E_{1cm}^{1\%}$

[illegible] transmittance [illegible] inorganic [illegible]
national institutions [illegible] photometric scale [illegible]
.periodic calibration [illegible]

Operation of spectrophotometers [illegible]

[illegible] valid [illegible] instruction manual [illegible] double-beam [illegible] calibration [illegible] .reference beam [illegible]

solvents for use in the ultraviolet region [illegible]

[illegible] lower [illegible] hydrocarbons [illegible] transparency [illegible]

[illegible] 1 [illegible] 0.4 [illegible] 750~) [illegible] 1 [illegible] cyclohexane [illegible] 240 [illegible] .0. 10

Identification tests in the ultraviolet region

ƙĔĤǫ̈ ĞĔDzÊÀAGää ĞĤìjä ĞÕÛÁą Ž Ʉəʐ̂Rää ZɆÛää âÀĔę ZĄǪÒǩ qualitative ĞĔÀĔõ ğäǿÁĞǪǹää ğäåşÀzǧä åǽÉHưł îşÀÎää Ǩǫ̈ÀõÕ ääæŮ .ĞŧəɎĦą ÀǰõÜ ÕĔDzÊǩ ǧäåÛ òÀŧĤǪèä ɹʐÒʌ ğäǿÀĞǪǹrä ĆØŁ ÕǰąŽ .ǿÁÊţä òʐùş òʐŸ+ä ÂĔõÀǩ .ÂĔõÀǪǿää ÈĔǿş ÀAŸǪÁĦą òʐŸ+ä ɒÁĉ ɹʐÒʌ ɹŮ Æz ÛĞòÀn ǧäåÛ ÕDZɉ ĞŧəɎĦą Kɖ ĞÆĐǪţä ĞĔĤDZÀţä ǧåÀţä Ħnʐŧȝ ÛĞĔĤDZÀą åäzą òÀŧĤǪèä Ʉəʐ̂Rää ZɆÛää âÀĔÕǿ ĞÀǪĞǪÒţä ȣäÀĤǪèrä ğäǿÁĞǪǹä ŘĦä ÆŸÛǪǩ gÀŘHưą ØəÆÁȝ ĞĔĤDZÀţä ǧåÀţä ɹʐÒǩ ɹŮ Æz .International Chemical Reference Substance ĞĔǿşÆää ĞĔəÀĔŧĔÒää B Àą .ǿÁĞǪǹrä ǧåÀą ÕDZɉ ĞŸŧĤǪÊţä Õ̃Ÿǩ Ȝą ĞĔŸŧĤǿä ğÀÀÅ8ää ĞzÀõ ÕDZɉ ĞŸǪÀŧǪĦą ĵşÀì ǨƠ ǨęzǪĦą ÕÒÎä ĞÊĔÕǹş ā̃zǫ̈Àţä ÂĔõÀǪŸǿ ĦÕǲş ĦÀŘHưą òʐŸ+ä ɹʐÒʌ ɹŮ Æz ÛĞĔĤDZÀţä ǧåÀţä òʐŸŢ ƘŘƠ Ž Ûgşå̈Àzǧä Ž ȜÀnŵ ĞÕʌÀÛä dbĦĤł ÛĞDZzţä òʐù ȝřş :ȣŸʌ Åư ŵ¥õ âÀĔÕää ÕDZɉ ĞŸǪÀŧǪţä ĵşÀÎää dbŧŘǪǩ .(ĞŧĔÕää dbą %10 dbŧř Õǿé ȣøÁĦʌ) ĦGʌÀÕǩ .transmittance (æÀÀÁǿä) àäÀǪąrä ğÁʌzǪÊą ĠĔHuÒǩş ÛgKDzΣä ĞĤĵřzą ÛĘÎää ô Àȝ ȳÀÒgŮ

Ž ąî Åŧţǿää ĻĔę ĞGÊφ ÕĔÔHuǪä ɹʐÒʌ ĞĔDzÊÀAGää àzz ĞĤìjä ĞÕÛÁą Ž ȣÀĤǪèrä ğäǿÁĞǪǹä ÕDZɉ ÆĔÀţä āzŸèjä gåÅŧŸö ĞDZÀΣä ÆĦDzŧş ǿÁĞǪǹrä ɔŸȝ ĞĔǩäşåjä ğÁzŸǪǹrä Kǫüǩ ðäÀDZqä äØŁ ÀȣÔł .kǪÁǫä kǪĔŧŢȝŮ kǪDZzą òʐù .ĞĔĤDZÀţä

hυĭŒШ ƨ 2ŒĞ©ΠΕ ƧNjƶ huy"ɭŮε huѕŮŒDŽ Ĭƶ huĭŒlΠΕ l ɲŒĭĭyɬΠΕ

Quantitative determinations in the ultraviolet region

Åŧõ ÀĤŘ+ä ÛǿÁĞǪǹrä gåÅą òʐŸŢ dbą ǰǩÅÁǿä ąî ÅŧǪǿä ĞǪǿÁÕą ÕDZɉ ȜɆÛää âÀĔę ğÁÊMÅÕą ÆŸÛŘ Åą gåÅȝ ŵŗşŮ ȜəʐRää ZɆÛää âÀĔę ğäǿÀÐZŮ ĻǪǩ ğɾÅΣä ÕǰąŽ .ĞĔĤDZÀţä gåÅţä òʐŸŢ ąî Åŧŧ Ȝą Ûgåşå̈Àzǧä Ž dbĦĤą zŁ ĞȝÀÊǿÅæ ȣøǫ̈ÅǰǿäÀ ǿäÀDZqä àÀƵŮ ĻǪʌ .ÅƵÔHuz åäÀţä gåÅţä dbą ÀŘHưţä òʐŸ+Åæ ŵĔǫ̈ÅǪş ĞĔĤDZÀţä gåÅţä dbą ÀŘHưţä òʐŸ+Åæ .ÅƵÊÅǫ ĞĔGʌÀDzǪǿää îşÀÎää òÀŧĤǪèÅæ Ûòşjä ǿäÀDZqä ÆĤæ ĞÀÒŧţä

ğäåşÀzǧä ȣÛĤǩ .ĞęŸĤöää Bǽ ÆõÀŧŸö ȣÀɆÛöää î ÀÔǪąrä gşǿǽ ÆȝƵəʐRää ZɆÛää ğÁÊMÅÕą àÀƵŮ ĻǪʌ Åą gåÅȝ ZɆÛää ÈĔMÅÕţ dbÒɛ ¢φŮ ȣşÀĤţä dbţ ¢φŮ .ĞęŸĤöää ğäǽ gåÅŧŸö î ÀÔǪąrä gşǿǽ ÕDZɉ ŴÒÙ òʐGÕţä ĞDZzţä òʐù ĞŸŧĤǪÊţä gÆEɔä Ğèǿåŧţä ğÁĞŸÛǪą ÆŸÛǪǩ .gşǿǿää ĆØT ÀŁÅŢöää ĞDZzţä òʐù Ž ĞʌÀ8ÒŮ ğäK8ǩ ǿÅƵşŮ ĞÅŸǪÁţä ȜəʐRää Ž ɔÛĤţä Ȝȝzʌää ĞDZzţä òʐù dbą ŵÆæ ÛĞʌåÀÀää gåÁjä Ž åzDZzţä ȜŸĤÀää gşǿÓää ĞDZzą òʐù òÅŧĤǪèä dbÒɛ ¢φŮ dbą ÀǰõüæşÛÀǪązφÅφ 280-240 òÅÕä Ž ÀǪązφÅφ 0.5± ÀǰõüæÅŧƵŘĦæ dbȝ ǩǪDZzţä Ƃzù Z¥ǪƐ r ɹŮ îÀÌ Ûgåşå̈Àzǧä dbÒɛ ÛÕöæ dbą ƎõŮ àÀÀää ɹÅõ ääæŮ .ÀǪązφÅφ 320 àzz ÀǪązφÅφ 2± dbą ÀǰõüæşÛÀǪązφÅφ 320-280 òÅÕä Ž ÀǪązφÅφ 1± .gåÁjä ǨĔĤǩ gåÅȝüæ ɔòʐł ɹŮ

International ĞĔǿşÆää ĞĔəÀĔŧĔÒää ĞĔĤDZÀţä gåÅţä Ħnʐŧȝ ÛĞĔĤDZÀţä gåÅţä òʐŸŢ âÀĔęş ƘŘƠ ĻǪʌ ɹŮ Æz

Quantitative determinations in the visible region [illegible]

[illegible]

[illegible] "Quantitative determinations in the ultraviolet region [illegible]" [illegible]

[illegible] 5 [illegible]

[illegible]

SPECTROPHOTOMETRY IN THE INFRARED REGION

[illegible] electromagnetic spectrum [illegible] 250-4000 [illegible] $^{-1}$ (40-2.5 [illegible])[1].

[illegible] optical isomers [illegible] Polymorphism [illegible]

[illegible] transmittance [illegible] absorbance [illegible] absorption spectrum [illegible] specific extinction [illegible] absorptivity [illegible] "Spectrophotometry in the visible and ultraviolet regions" (24 [illegible]).

Apparatus [illegible]

[illegible]

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[1] [illegible] Wavelengths [illegible] wavelengths [illegible]

[illegible] .detection devices [illegible] optical materials [illegible] .detector [illegible] monochromator [illegible]

[illegible] cm^{-1} 670-4000 [illegible] (15-2.5 [illegible]) [illegible] reliability [illegible] .polystyrene film

[illegible] attenuated total reflectance technique [illegible] single-reflection [illegible] attachment [illegible] alignment [illegible] .maximum transmission [illegible]

Use of solvents [illegible]

[illegible] .([illegible])

[illegible] carbon tetrachloride [illegible] 1 [illegible] 4000 [illegible] 1700 cm^{-1} (2.5 [illegible] 6 [illegible]) [illegible] IR [illegible] 2000 - 2400 cm^{-1} [illegible] 40) cm^{-1} 250 [illegible] 1 [illegible] 1300 - 1800 cm^{-1} (7.5 - 5.5 [illegible]) (5.0 - 4.2 [illegible]) [illegible] 845 - 875 cm^{-1} (11.8 - 11.4 [illegible]) [illegible] .transparency [illegible]

Preparation of the substance to be tested [illegible]

[illegible] mineral oil [illegible] potassium halide [illegible] attenuated total reflectance technique [illegible]

capillary film .*Method 1*

.*Method 2* 5-2 mull semi-transparent

.*Method* 3 potassium halide IR IR 1 – 200 1 – 300 prism instruments 300 1.5 grating – halide 300 1.0 15-5 5) 2000 transmission specific absorption %75 compensation.

.*Method 4*

Identification by reference substance

670 4000 $^{-1}$ 2.5 15 %5 %2 transmittance.

[illegible] 2 [illegible]

[illegible] 2 [illegible] mineral oil [illegible] fluorinated hydrocarbon oil [illegible] hexachlorobutadine [illegible]

Identification by reference spectrum [illegible]

[illegible] ([illegible] 15 [illegible] 2.5) $^{1-}$[illegible] 670 [illegible] 4000 [illegible] International Reference Spectrum [illegible] International Reference [illegible] reference absorbance [illegible] Spectrum International [illegible] superimposed [illegible] polystyrene [illegible] maxima 9.73) $^{1-}$[illegible] 1028 ([illegible] 6.25) $^{1-}$[illegible] 1601 ([illegible] 3.51) $^{1-}$[illegible] 2851 [illegible] Reference Spectrum [illegible]

[illegible] International Reference [illegible] Spectrum [illegible] resolving power [illegible] International Reference Spectra [illegible] ([illegible] 5 [illegible] 2.5) $^{1-}$[illegible] 2000 [illegible] 4000 [illegible]

Attenuated total reflectance technique [illegible]

[illegible]

[illegible] translucent [illegible] 2-1 [illegible] rubber [illegible] plastic materials [illegible] reflecting element. [illegible] proper alignment [illegible] attachment [illegible].

ATOMIC ABSORPTION SPECTROPHOTOMETRY [illegible]

[illegible] ground state [illegible].

[illegible]

[illegible] flamless [illegible].

Apparatus [illegible]

[illegible] spectral line [illegible] nebulizer-burner system [illegible].

[illegible] hollow-cathod [illegible].

[illegible]

Ʉəʒr̀ ļ₫ÁR̂ɬ₰ ô Ǻʒ ȳÀŢ℗ ǑƵ̊ɳ Ûţ ÀȞ̈ìÛ ȣÀÎÒô₰ ÛÄÔ⁂ȞÖ ₭℗ÀääÙn òÂʒ ǑDZj ǴûÀȟ ş̈ monochromator ǿÆÔɳ ɒɳ dzÅ₲Ôɳ ǥǿÀìÛ òÀŧȟℚè₺æ ȧäÀQǥ₹ä ǒÀ₳QÛ ÆŢŸöä ɒɳ ǰ̈ǩÀäöä ÕnäÆQţä ţÀȞ̈ìqä ɄBŸɬ Æę . î Àŧ₲ää Бǔ ₭ÎĔö ɒɳ ǴPÀ₳öä ÄìȞÅ₲ţä ǿÀ℔Qöä ǥǿÀìÛ ɔ8Ÿɬ ǪĔɯ ā ş₳₳Qţä ǿÀ℔Qöä Äǩäzǩ Бǔ ØəÆ₳ʒ ȣÀÎÒţä òɤƵ ɹǔ Æɀ .åǣŢ ÄǩäzǪæ ÛÂDzɳ ɹzÒ⁂ ƁØöäş Ûȣzǒä Ù₲Ţţä ǿÆÔɳ ɒɳ ǥǿÀìqä Ž ò₳ÆǪǿää ÙǒƵ ÛÄÕ⁂ äØŁ Ƶ ÎÒöä ȳÀŢ℗ Ǒƴɳ ɹǔz ȬöØöş .ÆŢŸöä .ǥǻÀţä Ž ɒ℔Ĥɬȣzè Ʉøǫöä ğäǿØöä ǻÆʒ ʒɳ ₥₲èÀ℔ɳ

Use of solvents ļ₣GŸPDŽ₥ε üF₫ŽyɬƨƐ

ğäǿǽ ǰ̂ɬ ƁØöä Ȭöǽ ɀŁş ǿäÆòqä ş̈ î ÀÔǫɳ₹ä ğǻ℔Ÿŧʒ Ž ƁÀ8ò̀ ÆŰ Ôn̈äÆǪ⁂ ƁØöä ɀŁ ƁÃ̌ƴţä ÆM⁂Ǿţä ÛŰĤDZÀţä òɀŸHʊŧŸö ƁØöä Ȭöǽş ǥǻÀŧŸö ǴDZşÂŸöä ş̈ ŲHʊÛÊöä ÄǩɀQöä ₭ä ₭₲õ ȧÀɀ ö₳Ł ɹÀõ ääÛ .ÆŢŸöä Ž ǴöǻÁĤǪɳ ÂŁõÄǩ À℔ú⁂ .ǴǷÆÉHʊţä ğäǿÀìqä Ž ǥ₭₲õ ₥ęşÀɀ ǴǷ₲Êɳ ÛǴÁŸQƯ ğ₹ÆĤɳ ǽÀɬ ş̈ (ÙÁÎɬ) ƵìÀɬ ȣɀè ÕĖöÅ∔ä ɹǔz ÔŧȟℚÊţä Ȭöǽş ǿÀ₲ǫn̈₹ä òɀŸŢ ₭ŘƠ Ž ÔŧȟℚÊţä Æ⁂Ǿţä ɹǔz ÛȬö⁂ş . î ÀÔǫɳ₹ä ǴĖŸŧʒ Ž ₥ŘM̀ ÕĖöÅHʊŧŸö Ř ŧΣä ɹ̈ Æzş Ûğ₹ÀÖä ₡ØŁ Ž ɹÀÒɳqä ǿÆę ₭ǒÀÎǫɳ Åǫƶ⁄ɹ̈ ş̈ ¢ÊÁφ ɀŁ Åɳ̊ ɹzÒ⁂ ɹ̈ Æz ŲĤDZÀţä òɀŸ∔ä ÕDZj Ž ǴǷ℔ò ğÅŧŁĖÐ₪ ÆDZɀǩ Åɳ₲Æ⁄ʒ .burner-aspirator ÆŢŸţä – ǴùÀÁÎöä āɀǴφ̊ ĘM̀Àù ɒʒ ǴöƵŢÊ₰ ÙÀÎɬ ₥ŸĖöÅŢ ŲÛĤɬ %2 ɒɳ Õę̈ ɹzÒ⁂ ɹ̈ Æz ÕĖöÅHʊŧŸö ÆŸÔöä Ƨɀǫ∔ä ɹǔz ÆǴÊöä ǽØŁ ÕDZjş Õn̈äÆQöä Ž ǥ̊Å⁂à ŲÛĤǩ Æę ÅŒǔz ÕĖöÅ∔ä .₥ÁÒư Ȭöǽ ɹÅõ ÅŧŸõ

RECOMMENDED PROCEDURE ₦ħ Ǐ Ţ Ăɑ̈z!ƒ ĈƒƧɳÚƒ

₭Ĥ₰Ôţ̈ä ÕǴę ɒɳ ¢₰ ɤòƵţä òÅÕä ŲÛ8ǩ ÂŁȭäÀQ₰ ¢⁂ĖĤǩ āɀŸÛţä ÀÔ⁂Ħöä ɒɳ ǴĖĤDZÀɳ ÕĖöÅŢ 3 ɒɳ Õę̈ È℔ö ÀŘĤɯł ǴĖĤDZÀţä ÕĖöÅ∔ä Бǔ ǥƎQÁţä ǥ̊Å̈ţä ɒɳ òɀŸŢ ₭ŘƠ Ž ÕŧȟℚÊΛ ƵìÀõ Ƀ̈ 8Å̈Řɬ ɹ̈ Æz .ǴŸŧȟℚÊţä ǥäǻQǫş ÀÔ⁂Ħöä .¢ÊÁφ ÂŁȭÀQǫÅ₰

ÜÕɳÅÒöä ǰ⁂ǿÆǫöä ɻ₫è ɤŸʒ ǥǒäÀÕöä òÆĤǩş ÆŢŸöä ɤŸʒ ǒÅţä ǽÀɬ Û(ǽÅÁ⁂ä) ȧäÀǫɳ¥ö ǥÀĖĤɳ ǥäşǻ̈ ɤŸʒ âÅŁÕöä ÕDZj . î ÅÔǫɳ¥ö ǥÀĖĤţä ǥäşǻ̈ä ÕDZj ₭ĤĐÔţ̈ä ǥÅŧĖŸĤǩ Бǔ ʒDZÀɬ .ʔÀn̈ǔ ğ¥⁂ÆĤǩ Ǵ₥ǔ ǥǻ̈ǻ̈ä ɒɳ Ùŧ⁂ä ä℔ØŁ ÆŸÛǪ₹ ǴĖŸŧʒ ÕõĖ ÆĤ₰ ǒÅţ₰ ₥¥ɳǻõ ÀÅŢɤä ÔÊ8⁂ş ǴΘÁ⁂ä ǴǪ₰ÅŽǿä ǥǒäÀÕöä ÕDzÊǩş ÛÆŢŸöä ɤŸʒ ǥäÀɳ 3 ŲĤDZÀɳ òɀŸŢ ÕõĖ ÆĤ₰ .ÂŁȭÀQöä Õ₰ÅÔɳ ǴǪ¥Žöä ǥäǒäÀÕöä ɒɳ Ǵʒɀŧ₣ Õõ Ùèɀǫɳ ÎÅÛǪn̈ä ĘM̀Àù ɒʒ ₭ĤĐöä ɤøÁHʊÁɳ ÀŘĤɯł .ǽǿ ääÛ Û¢⁂ĖĤǩ ɻǪ⁄ 8ɀè Ƀ℔öä ÀÔ⁂Ħöä ÂŁȭÀǩ òÆĤł ɒÒö ǥ̊ş̈Àzǵ̈ä Ž ɒĤɳ ɀŁ Åŧõ ǴòɀHʊÅţä ǥ̊Å̈ţä ɒɳ òɀŸŢ ÀŘĤɯł Ûǥ̈ä̈ɳ ɜ ÆŢŸöä ɤŸʒ òɀŸ∔ä ǽÀɬ .ǴŸŧȟℚÊţä ǥ̊ä̈ǻQǫ ¢₰ ɤòƵţä ÂŁȭÀQöä òÅ₣ ɒŧȞ ʒÕ⁄ ¢φ̊ǔz Ƃ₳Qöä₰ş ÛĦ℔ǿş̈ÀȞ Ȭöǽ ɹÅõ ɒɳ ÀÔ⁂Ħöä ÂŁȭÀǩ ₭ĖĤQö ǥäǒäÀÕöä Ùèɀǫɳ ÕŧȟℚÊɬ .ǽǿ ǴĖŸŧʒ Õõ ÆĤ₰ ǒÅţ₰ ₥¥ɳǻõ ÀÅŢɤä ÔÊ8⁂ş ǥäǒäÀÕöä ÕDzÊǩ .₭ĖĤQöä ɤøÁHʊÁɳ

FLUORESCENCE SPECTROPHOTOMETRY [illegible]

[illegible] 30 [illegible] 20 [illegible]

[illegible] dilutions [illegible]

[illegible]

Terms [illegible]

Fluorescence intensity [illegible]

Fluorescence emission spectrum [illegible]

fluorescence excitation spectrum [illegible]

Apparatus [illegible]

[illegible] (fluorometer [illegible]) [illegible]

[illegible] 90° [illegible] incident beam [illegible]

[illegible]

.ǨțÎță øÅĴţă ţÅĦìqă ÀČÔĦłđÒĭ àÀŧŁĕ òzùjă ĞDZzţă òzù Ьǽ ĘĭĭQŸĭ ĠŧÊʌ ĦĕÅǵ ĦĦÙÅę ĦHuțìÀą Ьzţ̣ÅĴĭă ÅŧŁz ĞòÅn ğăÂЬą ¢ĭ ĐÕõ Ûgåǽ̣ĦQą r̂ÅyĐ ÀzăzţǨ ÜZţ̂ÅÒŧŁõ ǒzŘŸĭ ĻĘÁÂŘǩ ÆĘǽẠ̊ęÛ ĘǽĭQĭă ÈĘʌÅÕą ĻŢĦą ȳÆÁţQÊǩ ÛUəzŘĭă øÅĘQĭă ĻĘÁŘǩ ÆĦǽ ÛŸÄÕĦ .UəÅǽÄŽTÒĭă ĴĘDzŘĭăș ÛÆÊÒĭăș Ûɔŧ̣ŢĦĭă ĠŁèÅÊΣă ğăǽ ĠŁÅĘÛĭă ĞÕÛÅŧ̣Åǽ ĘŸĦQʌ .ÕDzÊą ș̣Ů âÅĘę gÂĘŽDZ ɔŸʒ ĦʌøÅÔǽŮ ¢Qŧ̣Ęę

Åą̣Ů ÛĠŸìăÀŧ̣ă ÕŢ ÕƠ ɹzŸĭă ğăÆǵzţÊĦą ɹŮ Ž Ǵũ̀Ăŧ̣ă ĘĭĭQĭă âÅĘÕą ɒʒ ŲÕĭĭQĭă ŲəzŘĭă ZĘÛĭă âÅĘÕą ZŸQƐ ĘŸĦQʌ Åŧ̣Ęz Ǵũ̀Ăŧ̣ă Ęĭĭ̈QĭăâÅĘÕą ɔŸʒ ŲÕĭĭ̈QĭăZĘÛĭă âÅĘÕą àzʌÀQʌ ÛĞŸĘŸƠ ğÅÅđ ÕDZɉ .ŲÒĠÎĭă ÙŧʌŸĭ ș̣Ů ózìzŧŸĭ .ĞnǒŸŧ̣ăș ÛĞǫșÀŧ̣ă ÛĞDZzţă òzù ĞŁəÅÕǫÅă

ĞQǽÅǫ ĘĠəÂĭă ǴŁǽÅÔą ǽÉĦĶș .ŲÕĭĭ̈QĭăŲəzŘĭă ZĘÛĭă ÈĘʌÅÕąș ĘĭĭQĭă ÈĘʌÅÕą Ž ţÅĦìqă øǺÅÔą ɒą ÆʌÆĦĭă ȳÆÁţQÊł Ž gÀŧ̣QÊą Ğę̣Åù tungsten ĸQÊ8ĭQĭă ǴŁǽÅÔą ȳǽÉÕĶ .ŲÊĘəø ÕÒÎă ÛĞôÂĦĄą ʒăzrą̣Ů òăzùŭ Ž Ğę̣Åù øÆÔĶș ĦĘĠÊǫ ÅŒɉ ŲÕĭĭQĭă ŲəzŘĭă ZĘÛĭă ÈĘʌÅÕą Ž Ù8ŘĭăБÅĦĭă xenon arc ɹzʌĦĭă âzę dzÅĠÔą ǵÅʒ ÕŧĦQÊʌ .ǴŁəÀŧ̣ă ǴÕÛŧ̣ă .ǒăÀŧ̣Σă ŘƠ БŮ ǴĘDzÊÁʌĠĭă àzz ǴĦìɉă ɒą ÆQǪ ǵÄŧ̣QÊą ĞęÅù ÕŸǪ

ĦÂǽą ĞÕŁŘĭă ǴĦŸĄĭă Àązŕ .slits (àzÕÎĭă) ğÅĦŸĂĠÅǽ ŲÕĭĭ̈QĭăŲəzŘĭă ZĘÛĭă ÈĘʌÅÕą Ž ɹzŸĭă ğăÆǵzQÊą ÂŦDzł óÅĘQʌă åǽÆĦłđ .ǴŁÕÅĦĭă ǵÆÎĭă ΓÅÔĭ ğăÂЬţă ØØŁ ĞŘʌÀĦĭă ǴĦŸĂĭă ÀÊơ Ạ̊ŧǽ ÛĞŁÅÆù ǵşÅÕǫș high resolution ǽĦŁzó .ĞăzŸÛţă ǴŁèÅÊΣă ĞDZøåĂ ÆÊШ ÕØõș ÛøåÅÔĭă ţÅĦìqăș åøăzĭă ţÅĦìqă kă ĞDZzţă òzù ÕòÅz ÆÊШ ǴĦŸĂĭă ô Å3 ZĘù ÈĘʌÅÕą Ž ǴŸŧĦQÊţă ÕŸǫĭ ĞõÅÎą ǴŸŁÛQÊą ĘĭĭQĭă ğÅèÅę Ž ǴŸŧĦQÊţă (ÅʌŸǪă) ğăKDzΣă ɹzÒĶ Æę ğăKDzǵ ÕŧĦQÊĶ Æę ș̣Ů Ûţ̣ÅÕĭă ŽșǴĦăøɉă ĠʌåzŧĦĭă ÆǫăzɔăɔŸʒ ĠăzÕÔą ɹzÒĶ ɹŮ ăÆ3 Åą ÛŲəzŘĭă î ÅÔǫɾă ÅŸĠèÅʌĶ ɹŮ ɒÒƐ ğăşåɉă ŘĦă ɒÒĭ ÛÕą 3-2 zŁ ÆèÅʌţă ĻDzΣă .òzÕÔą ǴÛÊą ţÅę 3ą gøşÆą ÆĘǽÅǫÛ ÕÒÌ ɔŸʒ .ÕęŮ ĦɾzŸŢ Æ3zQÊʌ ĦʌÀĦÌ ĦăzĠǫŮ ș̣Ů ÛÕą 0.3-0.1 Æ3zQÊĶ gK8ò ğăKDzǵ

Standardization Ƨ ĭĭsĦ

ĞŁΘÅʌĶ ɹŧ̣ŘĭǨÅę fluorophore ĘĭĭûĶ ÔąÅШ ĦĘnzʌ ĘĭĭQĭă ÈĘʌÅÕąș ŲÕĭĭ̈QĭăŲəzŘĭă ZĘÛĭă ÈĘʌÅÕą ÈĘÕĶ ɹŮ Æz .ŲəzŘĭă ĻÁŘţă ĞŁèÅÊǵș dzÅĠÔţă gÆì Ž àșÀÀĭă ÕŽą ĞĶăşåɉă ğăK8Qţă БŮ ğɾÆĠǫĭă ƤÂĦł .ĞăÅDzQèŸĭ ĞHŁĦò gÅÕÄą ƤÀnŮ ĞÕĭĭ̈Qą gåÅą șŮ ǿÅĠQʌŸĭ ʒŘơ ŲøQĭă ĞÕĭăQţă gåÅţă ɒą ĞŁÕǫ ĞÅÕʒ fluorophore ĘĭĭQĭă ÔąÅǵ ɹzÒʌ Æę ɒą ZąƯ òzŸŢ Ž quinine ĸÆÒĭă ǽÉĦł .ǿÅĠQʌɾă gåÅţ ŲøQĭă ÕŸǫĭ ĞõÅÎą Ęĭĭûș î ÅÔQąă ĞùÀÌŮ ÕŸǪ ÕÔĠÊą ĘăĭQŸĭ sodium fluorescein ȳzʌåzÔĭă ĸÅÊʌǿźŸzș Ûàǿàɉă ĘăĭQŸĭ ĻəŸą ĘăĭûĶ Ôąǵ ÕʌǿzÀŸÊĭă Řƥ .ÀƥɉăĘăĭQŸĭ rhodomine ĸąåşÀăș ÛÀŘɴɉă

Calibration of the wavelength scale ĥƱĦNjÐŽĦƐ üNjƯ ƛĭƥơł !Ĥƨ ƥĭĭył

.Ħʌǿşå ŲÕăĦQĭă ŲəzŘĭă ZĘÛĭă âÅĘÕţ ĞDZzţă òzù (ğÅzǿÁĶ) ɟʌǿÁĶ ĻŸè ÀĦĘĤł ɹŮ Æz

Preparation of solution üNj‡ΘDŽ‴ε ƥĭƮΘł

ÕȮÎ₴ ȯȦŁȦĞä ĞDZóåş ¢ĸşȦÕ₥ş ¢ÊȦ₥ ÆʌØţ₴ Ȧ₥úʌ Áę .ĠŁHʊò ÕȮÎ₴ â˙ŁÕÝö ÕŧĦ₥Êţ₴ ÆʌØţ₴ ɔÕ₥Ł ɹǔ Æz .ĘöüQÝö ǓȦŁÛä ţȧzǨöäş ǥÁÎä Ž ûzHʊÝ₦

ÕŁöȦ‡₴ dn₦ ǥÀ₦ 100 Бǔ 10 óäÆÕ₦ Õ₹ǔ ÂŁõäÀ₳₴ ǓÕäüQöä ʊəzRä ZŁÛä â˙ŁÕ₦ ÕDZɟ ǥÀŘ‡₴ ÕŁöȦ‡₴ ɹzȮĸ ĞÛĠĸÀ₦ ĘöüQöä ǥÁì ɹzȮĸ ɹǔ ВóşÀRä dn₦ ÛĞÝŁÝHʊ₳ä ğȦÕŁĠÛ₳ä Ž .ʊəzRä î ȦÔ₳₦₹₴ ZŁù â˙ŁÕ₦ Ž ĞÝŧĦ₳Êţ₴ áóäz₳ä ȯzRä dn₦ ÕKĠõ ÕöÂDZ ɹǔz Ûǥ˙Î₴ ÕÂõÀ₦ ȯzÝ‡₴ ɹȦõ äæǔ dȮö Ü ğȦèȦŁÕÝö ÕŧĦ₳Êţ₴ ȯȦȮä Ž ÂŁõÀ₳ä ʒ₦ ÕÛn ɹǔ ǓøʌĦʌ äØŁş .ÂõÀŧÝö Õòäz₳ä ȯzRä Ž ÕrȦAYä ǰ₳ʌ БȦ₳ä₴ Û(ĞŁÝ˥ä) ǥKDzΣä ĠÛè dn₦ Ġ₥ÀÕ₦ ǥÅţ₴ dn₦ Ò₳ŧł ĞŁèȦÊǥ ĠÕʌÀù ɀŁ ǓÕöü₳ä ʊəzRä ZŁÛä â˙ŁÕ₦ ɹǔ ÛŞΣä dÊΣ "inner fulter ǓÝnåå ĠȮȦŧõ" ÕŧĦĸ ȦɎÊȦ₥ gÅţ₴ .ȯ/ȯz₦ 10-7-10-5 dn₦ gÅʒ ĞÝŧĦ₳Êţ₴ ÂŁõäÀ₳₴ ÛĦ¥òǔ ÕÆDZ

Û(*c-d*)/(*a-b*) ĞǤÊʌ₴ ɹǔz ÛĞÕöü₳ţ₴ gÅţ₴ ÂŁõÀĸ ʒ₦ ÕǤèȦA₳₦ Ę₳₴ü₳₴ ¢ʌŧr ɹzȮʌ ВÓ₴ş gÅʒ ÕÆDZ ĘŁÊʊ₴ òȦÕä ÆǤÊ₥ Ûg∃₳Áţ₴ gÅŧÝö Ę₳₴ü₳₴ ǥÁì g₴äÀę ǓŁ c ÛĘzäzţ₴ ÁŁȦÎÝö g₴äÀÕ₴ ǓŁ b ÛĞŁĦDZÀţ₴ gÅŧÝö Ę₳₴ü₳₴ ǥÁì g₴äÀę ǓŁ a Q˥ǥ ʒʌÔł ɹǔ ВóşÀRä dn₦ Ó₳Æʌʒ .2.50 dȮ ÁʌÂĸ ŗş 0.40 dn₦ Õę˙ ɹzȮĸ ŗ ɹǔ Æz ÛĘzäzţ₴ ÁŁȦÎÝö g₴äÀÕ₴ ǓŁ dş .ÂŁõÀ₳₴ Õ₥ÕÔ₦ solvent blank ÆʌØţ₴ ÁŁȦÌ ÕDZɟ ĦǓʊÔ₦ Ę₳₴ü₳₴ ǥÁÎÝö ÕŧȮ ɔ₴ʌĦʊĦ₦

Measurement technique Ƨ ƒĭśŀ‴ε ĥʊśĭþƯ

ĞnÂΣä ǥÁì ÆəäzÎ₴ ¢ØŁ Õ₹₦ ÒÕʌĦ Áę .ó˙ĠQnŗä ȯzÝƮ Ž ĞĠÝÔ₴ ğȦŧŁÊɔä åzDZz₴ ĞèȦÊǥ Ę₥₴ü₳₴ ğȦè˙Ł₥ ₥ÁĦĦ ¢₦üz ÛäØÓŁş .(ĞŁÝ˥ä) ǥKDzΣä Ž ǥåÁĦQţ₴ ğȦè˙ÓĦ₴ŗä ÆʊÊ₥ ĞÝ₴RĦ ĞŁÕȦ₹ ğ₴ÕäÀę ʊÛĤĸ ş₹ǔ exciting beam ǥKǰţ₴ ÁŁìÀ₴ä à₴óş₹ǔ ŔĦ₥ Bzȯ Áę ȮÒö ÛÁŁìÀ₴ä ȯȦŧĦQè₴ ĦRʌ₹ ȮÒƐ ÜÓŁĠA₴ÕÀ₥ ĞĠÝÔ₴ ğȦŧŁÊɔä dn₦ ÒÝÁ₴ä ĞŧÒΣä dn₦ .ĞÕ₹ǔQn₦ Æəäz˙ì

Õ₹n ÛàȦ8öä Ğöäà₹ǔ ÕäÀDZ₹ ȯȦŧĦQè₥ Ę₳₴ü₳₴ ǥÁì ä₴åÂĸ ÐÀ₴ä₴ş .Bzę åȦŧÁQè₴ À₴ǔ ÆʌØţ₴ Ž Æəä₴ä₴ kDzÊÕǥ₴ Õ₹ę .ó˙ĠQnŗä ȯzÝƮ Ǝ3 Ànǔ Õn₦Ȧŋàḍ Bǔ ş₹ǔ kDZş₳Q₳ä ğȦʒȦÕz ȯȦnåǔ

ǥÕȦÀÕ ŔȦÁĸ Æę Ûåäzţ₴ ŔĦ₥ ÕDZɟş .ǓÕöüQöä ʊəzRä ZŁÛä â˙ŁÕ₦ Ž ĦÎÝ ĦnȦŁ ǥ₴äÀΣä ĞDZóå ĻŁŢĸ ÆĦł ÛĞ₥zḍÀn ĞŧŁŢʒɟ₴ ĞęÆ₴ä Ǩq₦Õ ä₴ǔ ÛĆÓŦÕ ğ ŗÁǥ Ž .ǥ₴äÀΣä ĞDZóå Ž ţȦÀĸó₴ ĞDZóå 1 ÕȮö %2-1 óäÆÕ₦ Ę₥₴ü₳₴ ğȦè˙Ł₥ öäÀDZ₹ ĦzȦÕ ɹzȮʌ Æę ÛĸŁĸş₳ä ÕŁÝHʊ₳ä ÕDZɟ .ĠŁèȦè₹ ĞÛ₹Rţ₴ ǥ₴äÀΣä ĞDZóå ğ₴æ ĞȦĦĦ₴ä ğ₴KDzǥ ₥ÁĦz .ÁʌÁÉì ȯz˙r óÁÊÔţ ô ÀĦ₳ä ÁÁʒ ĦÝŁÝę ŗǔ óȦĠQnŗä ȯzÝƮ dÅÊʌ ŗ Б˙Ą₳ä₴ş ĞŁzȦÕ ĞʒÀÊ₴

ÛHÕöüQöä ʊəzRä ZŁÛä â˙ŁÕ₦ Ž ğȦ₴Õ₳ţ₴ ÇØŁ ô ÀĦQĸ Ȧn₥Áʒ .ȯzRÝö ĞèȦÊǥ Ę₳₴ü₳₴ ğȦ₴Õ₳ę dn₦ ÁʌÁĦ₴ä ₥ÁĦł ĞæȦDzQèä ĘʌÀù dȮ óȦǫ₴ä ÇØŁ Õ₹n ZÎõ dȮ .ĦÕöüĸ Õę˙ ş₹ǔ Ä₹õǔ ğȦDZzQȦn₦ Бǔ ʊəzì õØ₥Áĸ ȦT ɋÁʒ ÁÕz .Õnȧ₳ţ₴ ş₹ǔ Ǵì₳Ţ₴ ȯzRä ó₥ÁÔ₦ ĸŁzĸ ĘʌÀù dȮ ÀȺÁĦ Áę₹ ÛdnÂä ȮȦ₦ ĘÝĦQʌ ȦŧŁz 8ȦÎÒţ₴

TURBIDIMETRY AND NEPHELOMETRY

â ÀÊÕöä ?ÀDzł æů ÛÅą Ùèş Ž ĞÕŒĦą ğÅŧŁÊDZ ›Ÿ3 gåóäzöä ţÀĦÌìqä ĞąÂΣ kŁzQöä ĞDZóÆő ŒèÀÊę ÀÒĦöä â ÀÊę ÆĔĦł Ʊəzř Z£ù â ÀÊÕη şů ВóÀÊĦą Ʊəzřr ÀŒŐõ ĆĞÌÀħ Bć Ʊəzř â ÀÊÕη â ÀÊÕöä ?ÀDzł Æę .gÀÌÀĞą Ğęóåą ĞĦÌÙ ĞąÂg Ž .ÆèÀÅą ĞDZzą òzù Ž gŏÅřů Bć

ĞĦÌìjä ĞąÂg ›Ÿ3 ŒÅźŧ3 gåÅ3 â ÀÊÕöä ?ÀDzł ÛĞGŸò ğÅŧŁÊDZ ĞÛèäzä ŘQÎQħ òzŘő ŒèÀÊę óÆĖÒöä â ÀÊę ÆĔĦł .gåóäzöä

ŒÆDZ ĞÁäŒÁħ ÕÊÖÅ∔ Ãğžğöä dbą ĞŸÓÎQţä ğÅäÀèÀŒä â ÀÊę ÕDZj ŒÆĖÁą óÆĖÒöä â ÀÊę şů ÀĖÒĦöä â ÀÊę ɹzÒΛ Æę ǰəÅQφ Бů òzòzöä dbÓƐ ÆÕz ãØŁ ÆĞÊä .ĞŁązQÀƧä ΛΜŸ٦ä ğÅÕŸĦQÊą Õ?ą ÛĞŁəÅŧŁÊŒZ gåÅą ĞÁÙ şů ÛZ٦ìäzÓŸõ ΛΜŸ٦ä 3ą Œòz Ôn Ûʒşåâţä óÅÊÒφrä Бů åzĦk ğŸÓÎą Ȣå ÔŘk Æę .ĞÁÀÁĦä ğäK8Qţä Õõ ÙĞr ÆzşÛĞÕèÀQą .ÀŦèÀÊę dbÓƐ Æę gÆÎä ĞÁÀÁÅţä ğÅÕŸĦQÊţÀz ÛŒÁÒư ĞŁHÞÔöä ÙĞŘöä ɹzÒΛ ÅąÆÁ3 .ĞŁązQÀƧä

Terms ƖƑΘŦƯTŒ

dbŧŘQk .åóäş ţÀĦÌů ĘzÁĚk Бů óÅGQnrä gåÅą Ǝ3 ÓzÅφ ţÀĦÌů ĘzÁĚk kä ĞĞÊÁöä zŁ :*Transmittance (T) ȧäÅ/ąrä*

.transmission òÅÕφräş Tarnsmittancy ȧäÀQąrä ›ŘąÅŧŁz ĞŸŧĦQÊţä ğÅHÞŸÛÔţä

.ĞÕŒĦą ğÅŧŁÊƧ light-scattering effect ŏzŘöä ŘŁQÎk Àõj âÀÊę zŁ :*Turbidance (S) ÁŒÓĦ/öä*

gÆgş ÕÓö gåóäzöä ĞĦÌìjä ĞąÂg gÆÌ ÒęÅQõ ŒèÀÊę ÀÒĦöä ÆĔĦΛ ÛŏzŘöä ŘŁQÎk ğÅèÀÊę Ž :*Turbidity (τ) ÁQÓĦ/öä*

.dbŒĦą ĘŸĦQÊţ òzÛöä ğäÆgş dbą

Apparatus ŖFNJŒŒ

Ž gŏÅřů 3ą ÕŘÅł ÛƱəzŘöä ZŁÛöä â ÀÊÕη şů ВóÀÊĦą Ʊəzř ÀŒŐõ ĆĞÌÀη Bć Ʊəzř â ÀÊÕη ÀÒĦöä â ÀÕΛ Æę .(àóàjä ĞÌÀţä òÅŧĦQèÀä Ûòǰţä ÕŁGè ›Ÿ3) ZŁÛöä dbą õäÀŧΣä – ĞŁÕÀÕkƎöä ĞÕÛÁţä

JÙ ÅηŞ Üàóǰţä özŘöä dbą ŁrÆä ŘQÎţä özŘöä ›ÕŸQQõ Ğ3zřzη ĞŁəzřr ÀŒŐõ ĞŁŸN gåşÂą gäåÙ óÆÒöä ğÅèÀÊę ÆŸÛQk öÅÕQφÅä óÆĖõ ÈŁMÅÕŧõ ÕŧĦQÊk JÙ dbÓƐ gKnjä ℂØŁ JŭzΥ ÛŸÅ3 ÕÒÎä ŒŘΛÙ ĘöüQöä ÈŁMÅÕη ›Ÿ3 ĘGÛΛk ĞèÆΛTä ℂØŁ .ĞGèÀÅą ǴìäÅą

Instrumental measurement Ǐ øŦ£NjoqŬ£ ƧƑĭş‖Ɛ

gåÅ3 ãØŁ àÅ⊽Ù ⌊QΛ .ŒŸŧŦη JzÒΛ 8zè âÀÊÕöä ÆÊę ğÅŧŁÊƨä ÆÊèÀk JÙ JÅŧř Ʊøkäşåjä âÀÊÕöä ÕDZj ǴÔΛ Ʊøφöä Õ?k 3ą ğäöäÀÕöä ĞφóÁÕη ǰəÅQΛöä ÀÊÀk JÙ ⌊Ŧţä dbą .ĞÊęäş ĞÊφäşÀÅd gåÅą ÕəÅÊöä ĘŁŸĦQöä Ùèş kŧŘk ĘΛÀù ɒ3 .ŒąÅQ ÀŦÊÀφ îşÀÎöä ŘƠ ĞΘÅΛöä ÛĞÕŸĦţä gåÅŧŸö ĞηzŸĦţä ÂÊõäÀQöä Õğŧł

Visual comparison ƕŭƥƑƮǴǕƐ ƕŭƥƑƨǅǁƐ

ÆŀäÀφǚ ṗÉĦł .ʔÀǹɟä ğɍÀÖä Ŏõ Žş ɄŸǹäÆöä ÀÛŎöä Ž ɹÀÖŋɋä øÆę ǦŎżäżǪŋ ÆŀäÀφǚ Ž ÀÒĤöä ǦφøÀŎŋ ʔÀǅł

ǦææÀę ɄŸǹäÆöä ÀÛŎöäş Ŏŋ 70 ǦææÀę ǦĤÊöä ğäæş ȣÀÂÎöä ǯÀǅƵÂöä ȸŋ Ǧʒż ÂÔţş (ɃżǪÊţ) ǴÛÊţ ţÀŎöä ğäæ ǦφøÀŎţ

ɄəżȑøÆÔŋ ǥÆʒÀÊŋş ÛöäǻżȅǦŀÂŸǹ ŎæÀŎŋ ÛǬÆŎżǚ ÀÒĤöä ǦφøÀŎŋ ŎǅɟÆŀäÀφɟä ɃǛ ÀȚÂÂ ɹǚ Æƺ .ǦǴȅÀÂŋ ĻŸŋ 23

.ÆŀäÀφɟä ÆφäżǅȸŋȼǅżŊ

COLOUR OF LIQUIDS üəƐǋƨǁƐ ǅǍǋǁ

ɃøÀŀĤŋ ɹżö ȯżŸȚ ʒŋ ǥǻşÀżǧä Ž ƙĤŋ żȴ ÀȶõÀȒǂä øÀǪȵɍä ȯżŸȚ ǦφøÀŎŋ ŎəäżÊöä ɹżö ŎǅɟøÀǪȵɍä ʔÀǅł

ǻşÆɄŸö ȨżäżţäøÀǪȵɍä ȯżŸȚ ɹżö ǥÆȉş ǦǅøǻɁŸʒ ǻäÀȶǪʒä ɃøÀŀĤţä ɹżŸöä ȯżŸȚ ʔŎǪÀł .ǥǻşÀżǧä Ž ȣżȍżŋ

.ğÀÀȍäżţä Ž Ǧǵżȶ Êţä

RECOMMENDED PROCEDURE ǋǉ Ĭ Ţ ǍǁƑ ǷƑƧŋǗƑ

ȣÀÂÎöä ǯÀǅƵÂöä ȸŋ Ǧʒż ÂÔŋ ţÀŎöä ǦɄÛÊŋ ÆŀäÀφǚ Ž ǦφøÀŎţä ʔÀǅł ÛǥǻşÀżǧä Ž ʔÀǹǚ ǦŎÀü ƙĤł Ƀ Àŋ

ĻŸŋ 16 ǦææÀę ɄŸǹäǻ ÀÛę ÀȚ ɄøǪöä ÆŀäÀφɟä ṗÉĦł) ʔÀǹɟä ğɍÀÖä Ŏõ Žş ɄŸǹäÆöä ÀÛŎöä Ž ɹÀÖŋɋä øÆę ǦŎżäżǪŋş

50 ǦææÀę ŎəÀÊöä Ȩȶʒ ɹżÒÀ ɹǚ Æƺ ÛɃøÀŀĤţä ɹżŸöä ȯżŸȚ ȸŋ Ŏŋ 10ş øÀǪȵɍä ȯżŸȚ ȸŋ Ŏŋ 10 ŎȶĤǪÊł .(ǦǴȅÀÂŋ

Ž ÆŀäÀφǪö Ƀǻżȶǘöä øżȴä ǬÀΘÀæ ÀȚÀł ÀŋÆʒ ɃøÀŀĤţä ȯżȴä ɹżö ȸŋ ǥÆȉ ÀǯõǚøÀǪȵɍä ȯżŸȚ ɹżö ɹżÒÀ ɍ .ĻŸŋ

.ŏÀȒŀæ ǦŀÂŸǹ ŎæÀŎŋ ÀÎǪţä ŏżȒöä

Stock Colour Standard Solutions ƕŭĬǇǇǁƐ ǅǍǋǂǁƐ ƕŭƥƑĬƴǅ üĬǁƑƟǅǁƐ

Yellow stock standard TS ÀÀȍɟä ȸÂȴä ɃøÀŀĤţä ȯżȴä

ɹżö ȯżŸȚ ȸŋ Ŏŋ 10.7 ÛTS âÀɄÂöä ɹżö ȯżŸȚ ȸŋ Ŏŋ 1.9 ÛTS ǨöÀæżÒöä ɹżö ȯżŸȚ ȸŋ Ŏŋ 9.5 Ƀǚ ȣÀȒł

(ȯ/ȟ10 ~) ŎÀøżÀŸÊöä Ȑƥ ȯżɄŋ Ŏŋ 100 Ƀǚ ŻÀƧ ÛTS ÆÀÆΣä ɹżö ȯżŸȚ ȸŋ Ŏŋ 4.0 ÛTS ğÀŋşÀÒöä ɄəÀÀę

.ǯÂƹş ÛTS

Read stock standard TS Àƥɟä ȸÂȴä ɃøÀŀĤţä ȯżȴä

ɹżö ȯżŸȚ ȸŋ Ŏŋ 6.3 ÛTS âÀɄÂöä ɹżö ȯżŸȚ ȸŋ Ŏŋ 6.1 ÛTS ǨöÀæżÒöä ɹżö ȯżŸȚ ȸŋ Ŏŋ 40.5 Ƀǚ ȣÀȒł

10 ~) ŎÀøżÀŸÊöä Ȑƥ ȯżɄŋ .Ŏŋ 100.0 Ƀǚ ŻÀƧ ÛTS ÆÀÆΣä ɹżö ȯżŸȚ ȸŋ Ŏŋ 12.0 ÛTS ğÀŋşÀõ ɄəÀÀę

.ǯÂƹş ÛTS (ȯ/ȟ

Green stock standard TS ÀȒǹǂ ȁ ǳÂʅȁ ɃǿǺȆȞʈȁ ȯ ɀǛǂȁ

ɹɀȍ ȯɀǛʅ ǳŋ Ǒŋ 10.4 ÛTS ȃǺȞȁ ɹɀȍ ȯɀǛʅ ǳŋ Ǒŋ 20.1 ÛTS ǨǺɀȮȁ ɹɀȍ ȯɀǛʅ ǳŋ Ǒŋ 3.5 ƂǗ ȣǺȒł 10~) ȬǿɀǛÊȁ Ȑ ƥ ȯɀǛȞŋ Ǒŋ 100.0 ƂǗ ɀÂƩ ÛTS ǼǼΣȁ ɹɀȍ ȯɀǛʅ ǳŋ Ǒŋ4.0 ÛTS ǧǺŋşȮȁ ɄǝǺǭ .ǯÂʈʂ ÛTS (ȯ/ȟ

Brown stock standard TS ɄǿǺȁ ɄǿÂʅȁ ɃǿǺȆȞʈȁ ȯ ɀǛǂȁ

ɄǝǺǭ ȯɀǛʅ ǳŋ Ǒŋ 8.0 ÛTS ȃǺȞȁ ɹɀȍ ȯɀǛʅ ǳŋ Ǒŋ 17.0 ÛTS ǨǺɀȮȁ ɹɀȍ ȯɀǛʅ ǳŋ Ǒŋ 35.0 ƂǗ ȣǺȒł .ǯÂʈʂ ÛTS ǼǼΣȁ ɹɀȍ ȯɀǛȞŋ Ǒŋ 100.0 ƂǗ ɀÂǺł ÛTS ǧǺŋşȮȁ

Standard Colour Solutions ȟǐƥƑǐȳǲǁǁ Ǳǌǂǁǁ ǘǐǁǁƑƟǲ

ɄǿǺȁ ǳÂʅȁ ɃǿǺȆȞʈȁ ȯ ɀǛǂȁ) ǦǺʅȁ ǦǿǺȆȞʈȁ ǑǺȞʈǛȍ Ǽȅʈ ɀǺǺǭȁ ɃǿǺȆȞʈȁ ɹɀǛȁ ȯɀǛʅ ÀȒȞł ǳŋ ɃǿǺȆȞʈȁ ɹɀǛȁ ȯɀǛʅ Ǧʈ Êǩ ɹɀȮǩ .TS (ȯ/ȟ10 ~) ȬǿɀǛÊȁ Ȑ ƥ ȯɀǛȞŋ (Àȍǂ ş Âƥ ǂ ş ÀȒǹǂ ş ɀÔ ʅǿş (ɄǿǺǛȍ Bnş ÛÀȒǹǬ Gn ÛÀƥǬ Rd ÛÀȍǬ Yw) ǳÂʅȁ ɃǿǺȆȞʈȁ ȯ ɀǛǂȁ ɹǺÔ ƙǺȁ ƙɀÀǵ .ǦǺǺǗ ʔÛȞ ɀȽ Ǻʈȭ ÛɀǺǺǭȁ

ɹɀǛȁ ǑǺǂ ɀǺǺǭȁ ʅǿ ɃǿǺȆȞʈȁ	ǳÂʅȁ ɃǿǺȆȞʈȁ ȯ ɀǛǂȁ (Ǒŋ)	(ȯ/ȟ10) ȬǿɀǛÊȁ Ȑ ƥ ȯɀǛʅ (Ǒŋ) TS
0	0.78	99.22
1	1.65	98.44
2	3.12	96.88
3	6.25	93.75
4	12.50	87.50
5	25.00	75.00
6	50.00	50.00
7	100.00	–

ǳȮş Ȅʈ Îȁ ǦȞȉǗ ǳŋ Ǧʈʅ ÛǦǑǛ8ŋ ǦǱǺǱȁ Ǧʒş Ž 7-4 ƙȁ ȳǺʅǿǂȁ ǧȁ ǦǿǺȆȞʈȁ ɹɀǛȁ ǑǺʅ ǳÂơ ǳȮɀ .ǼǛǗȁ Ǽʒ ÀȒȞł ɹǗ ǼǱǼɀ ÀǯȭǗ ǦǺǺǺʈȁ ǦǿǺȆȞʈȁ ɹɀǛȁ ǑǺʅ

RADIOPHARMACEUTICALS ȟǐʅǁǲǁǁ ȟǐǌǭǓǁ

(radioactive pharma- ǺʒǺȞȉǗ ǦÛʈÎȁ ǦʈɎǼÔȁ ǻȁɀʈȁ) ǦȞÎʈȁ Ǧşǻǂȁ ǿǺǭǹş handling ǒǼǗ ǼǛÛǭ .ǺȽǾǺǺǭȁ ƙʈǝǺǑȁ ǦǺȽ ʔǛʒ ÀǜǺʈȁ ǑȫǑş ǦȞǺȍ ǰǝǺǭ ʔǛʒ ȯɀÔΣȁ ǳȮɀ ǪǺǁ ǦȍǺǹ ǦǺǑǩ ǺǿÀǚ ceuticals)

[illegible]

Definitions [illegible]

Nuclide [illegible]

[illegible] mass number [illegible]

Radioactivity [illegible]

[illegible] transformation [illegible]

[illegible] "disintegration [illegible]" [illegible] "transformation [illegible]

Radionuclide [illegible]

[illegible]

Units of radioactivity [illegible]

[illegible] (SI) [illegible] becqurel (Bq) [illegible] (S–1) [illegible] 1 [illegible] Curie (Ci) [illegible] 3.7 × 1010Bq.

Units of [illegible] measurement" (4 [illegible]).

Hall-life period [illegible]

[illegible] exponential decay [illegible]:

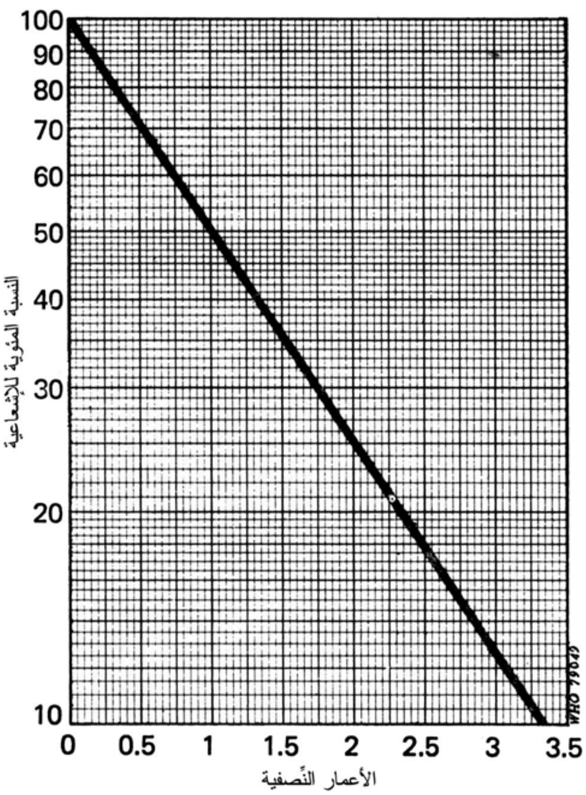
$$N = N_0 e^{-\lambda t}$$

[illegible] N [illegible] N_0 [illegible] $t = 0$ [illegible] λ [illegible]

[illegible]

$$T_{\frac{1}{2}} = \frac{0.693}{\lambda}$$

[illegible] .(1 [illegible])



[illegible] 1 [illegible]

Radioactive concentration [illegible]

[illegible] standardization [illegible] 30 [illegible]

Specific radioactivity (or specific activity) [illegible]

[illegible]

[illegible] 1" [illegible] (O–iodohippuric [illegible] 1 [illegible] (1 mCi of iodine-131) 131- [illegible] 75- [illegible] 40MBq" [illegible] "1979 [illegible] 1 [illegible] 12.00 [illegible] acid) [illegible] Selenomethionine [illegible] 1 [illegible] "1979/ [illegible]

[illegible] 1 [illegible] (131I) 131– [illegible] (*x* mci) [illegible] *x* [illegible] 1 [illegible] *y* [illegible] 131– [illegible]

[illegible] 131– [illegible] 1 [illegible] *x/y*

[illegible] purity [illegible] "Specific activity [illegible] "activity [illegible] "specific radioactivity

Radionuclidic purity [illegible]

[illegible]

[illegible] impurity [illegible] xenon–131m [illegible] 131– [illegible]

[illegible] (bequerels [illegible] curies [illegible] 1 [illegible] 125– [illegible] (99mci) [illegible] 99 [illegible] 125– [illegible] %99 [illegible] 126– [illegible] 126 [illegible] 125– [illegible]

Ž %1 ȸȝ 126-åȥŒŸö åȥĤʌ ɃÓöä ŬŸÒöä Ŭȝ̀ĤȞìqä ȓ̀Î ʌöä ÆʌÂʌ ɾ" :Õǰŋ ÛȸŋÂöä ȯȥǵ ǥøȧȝ ČĤÎŧä ǥṢ̀Õʌöä ƘGĤǨ ȸŧŘQʌ ÆDzŁȥ ẘŋȥʌ 30 ȸŋ Õę̈ŭ ŬÀÔẘöä À̀ŧĤöä ǥÆŋ ǧäæ ČĤÎŧä ǧäÆŒŸõȥ̀öä Ğöȧǵ Ž ."ĞęȧÔŸöä Ž ¢ŒŸȝ î ȥÔʰŧä ŬĤDZÀŧä ÑʌǿȧQöä .reference hour ČŒĤDZÀŧä Ğȝ̀ȧÊöä Ɓŭ ǥøȧȞìqä

(identities ǧ̀ʌȥTä ƁȧQöȧ̀ṢǴ ČÛÎǫɉä ɹȥÒǩ ɹŭ ÛȧŋÀŘĦȸQÊŧ ČĤÎŧä ĞʌÆŒŸõȥ̀öä ǥṢ̀Õʌöä ȯȥǵ ǥøȧĞȝ ȸȧÛȝŭ ĞŒ8ä ÛǴȒ̀äȥǫöä ȸŧ ¢ǫŭ ĞʌÆŒŸõȥ̀öä Æəäȥ̀Îöä ÕÒȯ âȧŒÕöäṢ ČŒǩǾöä ƙŒĤǪȯ ǥÆõúŋṢ ČÛŒỀä ÕəȧèṢ ṏȧŁ ÆDZȥʌ ɾ .ĞȥṢÀĤŋ åȥDZȥŋ ȝÎŋ ÆŒŸõȥǫ ÕÒȯ ÒÁÎöä ĞŧȸṏȧĦȸŋ ɔŸȝ ȧŋŭ ĞĤÎŧä ĞʌÆŒŸõȥ̀öä ǥṢ̀Õʌöä ȯȥǵ ƘGĤǪöä Æŧǫĥʌ .ÀȒĦȸQÊŧä Ž ǥÆDZəȥǫŋ ɹȥÒǩ ɹŭ ȸȸÒƐ Ŭøǫöä ČĤÎŧä ĞʌÆŒŸõȥǫ Æəäȥì Ȥ̀ÎǪÒǩ Ɓ" ÛȯȧŸŧä ÕŒĞè ɔŸȝ ÛĞŋÉÁǪÊŧä ĞÕʌÀÛȯȧ ȧÛĞǩÀŋ ƘGĤǪöä äØŁ ɹȥÒʌ ɹŭ Æz ¢ǫŭ ṣŭ ƘGĤǪȯȧ ŬøʌĤŧä ."ÿȥʌåȥÔöä Æʌåȥʌ detector ϑȧÎÒĥ ÿäÆÁǪèȧ gamma scintillation spectrometry ȧŋȧd ŬøφȧÊŋȥöä ȤŸÛöä âȧŒÕä ČĤÎŋ

Radiochemical purity ȟȕĭəƑĭDŽĭ|ⅡƐ ȟȕĭYƑyʼnŰƐ ƳNjƑsⅲⅡƐ

ȸĤĞŧä ŬəȧĦŧŒÒöä ÕÒÎöä Ž åȥDZȥŧä ȸĤĞŧä ȝÎŧä ÆŒŸõȥ̀ʌŸõ Ğʌȥȧŧä ĞĞÊʌöä ŬŁ ȧŋ ÀÊŘĦȸQÊŧ ČŒəȧĦŧŒÒöä ČŒȝȧĤĭìqä ǥṢ̀Õʌöä ȸŋȧÂöä ÆʌÆƠ ÆzṢ ÛŬȝȧĤĭìqä ÕÒÒȦǪŸõ ĞDzŒǪŋ ŬÊŒəø ÕÒÎä Ûȸŋȧ ȝŋ ČŒəȧĦŧŒÒöä ČŒȝȧĤĭìqä ǥṢ̀Õʌöä ȸŋÉĞǪǩ Æę .stated .ĘŒĞÛǪŸõ ŧŸəȧę ČŒəȧĦŧŒÒöä ČŒȝȧĤĭìqä ǥṢ̀Õʌöä ŋÉǵ ¢Œz ɹȥÒʌ ɃÓöä

ČŒȝȧĤĭìŭ ǥṢ̀Õʌöä ȥŁ (^{57}Co) ƙŋɾȧəȥṏzǫȧĦÊöä ÀÊŘĦȸQÊŋ ɹŭ ɔŸȝ ɹȧĞöä Ź ȧŋ ÛòȧŽŧä ÕŒĞè ɔŸȝ Ûäæŭ .ČŒĤUŒŕȥǩ ĞȚǵŸŋ ČŒəȧĦŧŒÒöä ČŒȝȧĤĭìqä ÆəäȥÎöä ȸŧŘǪǩ Æę .ƙŋɾȧəȥṏzǫȧĦÈ ÕÒÎä åȥDZȥŋ 57– ŘòȧəȥÒöä ȸŋ %99 ɹŭ ƁȧǪȧĞȥ Û%99 ČŒəȧĦŧŒõ .(^{57}Co) ƙŋɾȧəȥÊõṢǿÆŒTä ṣŭ (^{57}Co) ŬøǪȧəȥÒöä ɹȥʌȧɉä Õǰŋ ÆəäȥìǴʌKȚǫ ĞĤÎŧä ǴʌÆŒŸõȥ̀ʌöä ĞĞəȧÎöä ȸŧÒǩ Ɓ äæŭz .ȤʌÀĤǪöä Ž ǿȧǪȝɾä ƙĤä ĞĤÎŧä ǴʌÆŒŸõȥ̀ʌöä ÆəäȥÎŸö Õŧǫ+ä åȥDZȥŋ Ønúł ɾ identical chemical Õǫȧŧŧä ŬəȧĦŧŒÒöä ÕÒÎöȧä gåȥDZȥŋ ɹȥÒǩ ɹŭ ĦȧÒư ɹȥÒʌ ȸÒ ØəÆȧȝ ÛȸĤĞŧä ȝÎŧä ÆŒŸõȥ̀ʌöä ȝŋ isotopic Õŧǫ+ä ȸŋ ȝęäȥ̀öä ŽṢ ÛȸÒŧŧä ȸŧȥ ÛȸĤĞŧä ȝÎŧä ÆŒŸõȥ̀öä ȝŋ istopic ǴʌKȚǫ ĞĤÎŧä ǴʌÆŒŸõȥ̀öä ĞĞəȧÎöä ƘǪəṏ ȧŋ äæŭṢ .form .¢Êȧǫ ŬəȧĦŧŒÒöä ÕÒÎöä Ž ŭɹȥÒǩ ɹŭ

ĞŒZŭ Àǰõɉä ȥŁṢ ÛṢŭ ɃåȧŒǫȝɾä ÕÒȯȧǪŸõ ČŒȥȧǪǫ ÛȸʌÂÁǪöä ȸÀȧǪŭ ṣŭ ǥåȦŧä ƘŘƠ ȸÀȧǪŭ ĞĤȝȧĤĭìqä ÆəäȥÎöä ÀȚŢǩ ɹŭ ȸÒƐ .(ŧȧĤĭìRȸ ČŒəȧĦŧŒÒöäṢ ĞŒəȧʌÂŒȧöä ǧäƘǫüǪöä ÆĞÊȧ ÛäØŁṢ) Ŭȝ̀Ĥĭìqä ÕÒȯȧǪŸõ ČŒȥȧǪǫ Ûgåȧȝ

Production and handling of Radiopharmaceuticals ȟȕɏĈ]ⅡƐ ȟȕĭNjơqŰƐ ƀƐơqĭŒNj ŧƑŒŽŒ

ȸʌÂÁǪöäṢ ȯȧŧĤǪèɾäṢ ĘĢäÀŧä ȝŘơ .ČĤÎŧä ĞʌṢåȧȥǵä ȯȥǵ ǧäṢåÀȥǵä ɔŸȝ ĘŒÛŧ ǧäøȧĞǪȝȧä ĞŒÕȧǪöä ǧäÀÕȧöä]ǪőŭÛǧŧŒŢȧǪöä ȸŋ ƙǪȧǫä ƙǪȝȥŧƒ ŬøĞŸǩ ɹŭ ȧȚŒŸȝṢ .ĞŒȧÙȥöä ǧȧÛŸÊöä ÕĞę ȸŋ ȧȚŒŸȝ ĞęåȧÔŧä Ɓŭ ẘȥŧȝ ČĤÎŧä ĞʌṢåǪǫ ÕŧĤǪÊĥ ṣŭ ǰǪĦ ÕõɔŸȝ Æz .ẘȝȧĤĭìŭ ČÛŒÎöä åäȥŧȧä]ǪőŭŬøǪöä ÕŸǩṢ ĞĘɾÆŒÔöä ǧäÀŘĦȸQÊŧȧä]ǪőŭŬøǪöä ÕŸǩ .ĞĦȝÀŧä ƙǫäȥÕöȧä ČÕŸĤǪŧä ĞŒʌÙȥöä ǧÁGŸÛǪŧä ɔŸȝ ẘĤŸÛĥ ɹȥÒʌ ɹŭ

Carriers [illegible]

[illegible] isotopic [illegible] *Carrier* [illegible] dispensing [illegible] processing [illegible] non-isotopic [illegible] "Natrii Phosphatis (32P) Injecto" [illegible] (technetium-99m)m99 [illegible] rhenium [illegible]

[illegible] *Carrier-free* [illegible]

Detection and Measurement [illegible]

[illegible] electron capture [illegible] isomeric transition [illegible] $\beta-$ [illegible] (4 [illegible]) [illegible] (Positrons [illegible] $\beta+$ [illegible] X-rays [illegible] X-rays [illegible] (i · t) [illegible] 2 [illegible] (e.c) [illegible] 0.511MeV [illegible]

[illegible] (1 [illegible]) [illegible]

[illegible] electronic scaling [illegible] sensing unit [illegible] device [illegible] Geiger-Müller [illegible] solid-state semiconductor [illegible]

الجدول 1: المُمَيِّزات الفيزيائية للنوكليدات المُشعَّة

النُّوَيْدَة	مدة العُمُر النِّصفي[a]	نمط التلاشي[b]	طاقات الجسيم واجتماليات الانتقال		الانتقالات الكَهْرطيسية		
			الطاقة Mev	احتمالية الانتقال	طاقة الفوتون MeV	الفُوتونات المُنبثقة	الانتقاليات المنتقلة داخلياً
Cesium–137 سيزيوم –137	30.1a	β–	0.512	94.6%			
			1.174	5.4%			
					Via 2.6mim 137mBa		9.5%
					0.662	85.1%	
					0.032–0.038	8% (Ba K X –rays)	
Chromium –51	27.7d	e.c		100%	0.320	9.83%	
كروم –51					0.005–0.006	~22% (V K X –rays)	
Cobalt –57	270 g	e.c		100%	0.014	9.4%	78.0%
كوبالت –57					0.122	85.2%	2.0%
					0.136	11.1%	1.5%
					0.570	0.02%	
					0.692	0.16%	
					أخرى	كثافة منخفضة	
					0.006 – 0.007	~55% (Fe K X–rays)	
Cobalt –58	70.8 d	β^+	0.475	15.0%	0.511	من β^+	
كوبالت –58		e.c		85.0%	0.811	99.4%	
					0.864	0.7%	
					1.675	0.5%	
					0.006–0.007	~ 26% (Fe K X–rays)	

(a) µs = مكروثانية؛ ms = ميلي ثانية؛ s = ثانية؛ min = دقيقة؛ h = ساعة؛ d = يوم؛ a = سنة

(b) e.c = التقاط إلكترون؛ it = انتقال تصاوغي

Cobat -60	5.27a	β–	0.318	99.9%		1.173	99.86%	0.02%
كوبالت –60			1.491	0.1%		1.333	99.98%	0.01%
						أخرى	<0.01%	
Gallium	78.3h	e.c		100%	0.091	3.6%		0.03%
غاليوم					0.185	23.5%		0.4%
					0.209	2.9%		0.02%
					0.300	16.7%		0.06%
					0.394	4.4%		0.01%
					0.494	0.1%		
					0.704	0.02%		
					0.795	0.06%		
					0.888	0.17%		
					0.0008 – 0.010	43% (Zn K X –rays)		
					via 9.2μs ^{67m}Zn			
					0.093	37.6%		
					0.008 –0.010	13% (Zn K X –rays)		
Gold –198	2.70d	β⁻	0.285	1.32%	0.412	95.45%		4.3%
ذهب –198			0.961	98.66%	0.676	1.06%		0.03%
			1.373	0.02%	1.088	0.23%		
Gold – 199	3.13d	β⁻	0.25	21%	0.050	0.3%		3.5%
ذهب –199			0.29	72%	0.158	39.6%		36.4%
			0.45	7%	0.208	8.8%		8.3%
					0.69–0.083	~ 18% (Hg K X–rays)		
Indium –111	2.81d	e.c		100%	0.172	89.6%		10.4%
إنديوم –111					0.247	94.0%		6.0%

تابع الجدول 1: المُمَيِّزات الفيزيائية للنوكليدات المُشعَّة

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			الطاقة Mev	احتمالية الانتقال	طاقة الفوتون MeV	الفُوتونات المُنبثقة	الانتقاليات المنتقلة داخلياً
Indium –113 إنديوم –133	99.5min	i.t		100%	0.392 0.024 –028	64.9% 24% (In K X–rays)	35.1%
Iodine –123 اليود –123	13.2h	e.c		100%	0.159 0.347 0.440 0.506 0.529 0.539 0.027–0.032	83.0% 0.10% 0.35% 0.26% 1.05% 0.27% ~ 86% (Te K X–rays)	16.3%
Iodin–125 اليود –125	60.2d	e.c		100%	0.035 0.027–0.032	7% 138% (Te K X–rays)	93%
Iodin –126 اليود –126	13d	β^-	0.38	3%	0.389	32%	0.5%
			0.88	30%	0.491	2%	
			1.27	15%	0.511	β^+ من	
		β^+	0.46	~0.1%	0.666	30%	0.1%
			1.1	~0.4%	0.754	4%	
		e.c		51.5%	0.880	0.8%	
					1.420	0.3%	
					أخرى	<0.1% each	
					0.027 – 0.032	~38% (Te K X–rays)	

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(b) e.c = التقاط إلكترون؛ it = انتقال تصاوغي

Iodine –131	8.06d	β^-	0.247	1.8%	0.080	2.4%	3.8%
131– اليود			0.304	0.6%	0.284	5.9%	0.3%
			0.334	7.2%	0.364	81.8%	1.7%
			0.806	0.7%	0.723	1.8%	
		1.3% of ^{131}I decaays via 12d ^{131m}Xe					
(Xenon –131m)		i.t		100%	0.164	2%	98%
m 131– الزينون					بتلاشيات الزينون-m131)	(النسب المئوية المتعلقة	
Iodine –132	2.29h	β^-	0.84	16.0%	0.506	5.0%	
132 اليود			1.01	3.5%	0.526	16.0%	0.2%
			1.07	6.5%	0.621	2.0%	
			1.09	3.0%	0.630	13.7%	0.1%
			1.10	2.6%	0.651	2.7%	
			1.26	2.9%	0.668	98.7%	0.4%
			1.29	18.4%	0.670	4.9%	
			1.57	10.8%	0.672	5.2%	
			1.72	12.7%	0.727	6.5%	
			2.24	20.2%	0.773	76.2%	0.3%
			أخرى	3.4%	0.810	2.9%	
					0.812	5.6%	
					0.955	18.1%	
					1.136	3.0%	
					1.295	2.0%	
					1.372	2.5%	
					1.399	7.1%	
					1.433	1.4%	
					1.921	1.2%	
					2.002	1.1%	
					أخرى	<1.5%	

تابع الجدول 1: المُمَيِّزات الفيزيائية للنوكليدات المُشِعَّة

النُّوَيْدَة	مدة العُمُر النِّصفي[a]	نمط التلاشي[b]	طاقات الجسيم واحتماليات الانتقال		الانتقالات الكَهرطيسية		
			الطاقة Mev	احتمالية الانتقال	طاقة الفوتون MeV	الفُوتونات المُنبثقة	الانتقاليات المنتقلة داخلياً
Iron –55 الحديد –55	2.69 d	e.c			0.006	~28%(Mn K X–rays)	
Iron – 59 الحديد –59	44.6 d	β^-	0.084	0.1%	0.143	0.8%	
			0.132	1.1%	0.192	2.8%	
			0.274	45.8%	0.335	0.3%	
			0.467	52.7%	0.383	0.02%	
			1.566	0.3	1.099	55.8%	
					1.292	43.8%	
					1.482	0.06%	
Mercury –197 الزئبق –197	64.4h	e.c		100%	0.077	19.2%	80.7%
					0.192	~1.1%	0.9%
					0.268	~0.1%	
					0.067 – 0.080	~7.% (Au K X–rays)	
Mercury–197m الزئبق –197	24 h	e.c		635%	0.134	31.8%	61.7%
		i.t		93.5%	0.165	0.3%	93.2%
					0.067 – 0.083	36% (Au/ Hg K X–rays)	
					Via 7.8s 197m Au		
					0.130	0.5%	6%
					0.279	5.0%	1.5%
					0.409	<0.005%	
					0.67–0.080	~2% (Au K X–rays)	
		Daughter 197Hg الابنة 197Hg					

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Mercury–203 الزئبق –203	46.6 d	β^-	0.212	100%	0.279	81.5%	18.5%
					0.071–0.085	12.5% (T1 K X–rays)	
Molybdenum–99 موليبدينوم –99	66.2 h	β^-	0.454	18.3%	0.041	1.2%	4.8%
			0.866	1.4%	0.141	5.4%	0.7%
			1.232	80%	0.181	6.6%	1.0%
			أخرى	0.3%	0.366	1.4%	
					0.412	0.02%	
					0.529	0.05%	
					0.621	0.02%	
					0.740	13.6%	
					0.778	4.7%	
					0.823	0.13%	
					0.961	0.1%	
					Via 6.02 h 99^mTc in equilibrium		
					0.002	~0%	93.9%
					0.141	83.9	10.0%
					0.143	0.03	0.8%
Phosphorus – 32 الفُسفور –32	14.3 d	β^-	1.709	100%			
Selenium – 75 سيلينوم –75	118.5 d	e.c		100%	0.066	1.1%	0.3%
					0.097	2.9%	3.0%
					0.121	15.7%	0.7%
					0.136	54.0%	1.6%
					0.199	1.5%	
					0.265	56.9%	0.4%
					0.280	18.5%	0.2%
					0.401	11.7%	
					أخرى	<0.05% each	
					0.010 –0.012	~50% (As K X–rays)	

تابع الجدول 1: المُمَيِّزات الفيزيائية للنوكليدات المُشعَّة

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			الطاقة Mev	احتمالية الانتقال	طاقة الفوتون MeV	الفُوتونات المُنبثقة	الانتقاليات المنتقلة داخلياً
					Via 16.4ms ^{75m}As		
					0.24	0.03%	5.5%
					0.280	5.4%	
					0.304	1.2%	0.1%
					0.010 –0.012	~2.6% (As K X–rays)	
Technetium–99m تيكنيشيوم –m99	6.02 h	i.t		100%	0.002	~0%	99.1%
					0.141	88.5%	10.6%
					0.143	0.03%	0.87%
		Daughter ^{99}Tc الابنة ^{99}Tc					
Thallium –201 ثاليوم –201	73.5 h	e.c		100%	0.031	0.29%	10.1%
					0.32	0.25%	9.6%
					0.135	2.9%	8.9%
					0.166	0.13%	0.2%
					0.167	8.81%	16.0%
Tin – 113 القصدير –113	115 d	e.c		100%	0.255	2.1%	0.1%
					0.021 –0.028	73%(In K X–rays)	
		Daughter ^{113m}In					
Tritium (^3H) تريتيوم (^3H)	12.35 d	β^-	0.0186	100%			

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(b) e.c = التقاط إلكترون؛ it = انتقال تصاوغي

Xenon –131m الزّينون –133	11.9 d	i.t		100%	0.164 0.029 –0.035	2% ~52% (Xe K X–rays)	98%
Xenom –133 الزّينون –m133	5.25 d	β^-	0.266 0.346	0.9% 99.1%	0.080 0.081 0.160 0.030–0.036	0.4% 36.6% 0.05% ~46% (Cs K X –rays)	0.5% 63.3%
Xenon –131m الزّينون –133	2.26 d	i.t Daughter ^{133}Xe		100%	0.233 0.029 –0.035	8% ~59% (Xe K X–rays)	92%
Ytterbium –169 الإيتربيوم –169	30.0 d	e.c		100%	0.021 0.063 0.094 0.110 0.117 0.118 0.131 0.177 0.198 0.240 0.261 0.308	0.21% 45.16% 0.78% 3.82% 0.04% 1.90% 11.42% 17.31% 26.16% 0.12% 1.74% 11.04%	12.3% 50.4% 12.3% 56.2% 3.2% 13.5% 17.7% 25.7% 0.7%

[illegible]

[illegible] corrected count rate [illegible] R [illegible]:

$$R = \frac{r}{1 - r\tau}$$

[illegible] r [illegible] τ [illegible] resolving time. [illegible] counts. [illegible] 10000 [illegible] .%1 [illegible]

Absorption [illegible]

[illegible] absorbers [illegible] beta emitters [illegible] x-rays [illegible] 125– [illegible]

[illegible] "thickness [illegible]" [illegible] (μ) [illegible] (2 [illegible]) [illegible]

Method [illegible]

[illegible] "Natrii Phosphatis (^{32}P) Injectio" [illegible] half–thickness [illegible]:

6 [illegible] 10 [illegible] 20 [illegible] 800 [illegible]

logarithm (800) function

(1.205)

(20) (t_2, t_1)

(μ)

$$\mu = \frac{1}{t_2 - t_1} \ln \frac{A_{t1}}{A_{t2}}$$

A_{t_2} A_{t_1} t_2 t_1

half–thickness t_2 t_1

32–

%5±

(0)

Radiation spectrometry

Crystal scintillation spectrometry

scintillators

scanning

plus– height analyser

photoelectric peaks

[illegible]

[illegible] coincidence summing [illegible] backscatter [illegible]

[illegible] Compton [illegible] .fluorescent X-rays

[illegible]

discriminator [illegible] shielding [illegible]

[illegible]

[illegible] 125– [illegible]

[illegible] photoelectric peaks [illegible]

[illegible]

Semiconductor detector spectrometry [illegible]

[illegible] solid state detectors [illegible] peaks [illegible]

[illegible] valence [illegible] electron-hole pair [illegible] conduction band [illegible] band lithium-drifted [illegible] %5.9 [illegible] 60– [illegible] 1.33Mev [illegible] %33 [illegible] germanium [illegible] 7.6–cm ×7.6–cm

Liquid scintillation counting [illegible]

[illegible] ^{3}H [illegible] ^{14}C [illegible] ^{35}S [illegible] X– [illegible]

[illegible] discriminators [illegible] %60 [illegible] ^{14}C [illegible] %95 [illegible] ^{3}H [illegible]

[illegible] 2,5–diphenyloxazlole [illegible] *p*-terphenyl [illegible] Dimethyl-) 1.4-di[2-(4-methyl-5-phenyloxazole)] benzene [illegible] (POPOP [illegible] quenching [illegible]

[illegible]

Radiation Shielding

[illegible] background radiation [illegible]

[illegible] Bremsstrahlung [illegible] monoenergetic [illegible] X– [illegible] Bremsstrahlung

[illegible] Bremsstrahlung [illegible]

[illegible] exponential [illegible] half–value layers [illegible] %1 [illegible] 7 [illegible] handling [illegible] reference [illegible] multimillicurie [illegible] remote–handling devices [illegible]

[illegible]

Determination of Radionuclidic Purity

[illegible] gamma emitters [illegible] gamma spectrometry [illegible]

(a) [illegible]

(b) [illegible] detectors [illegible] resolution [illegible] (Ge:Li) [illegible]

(c) [illegible] fluorescent [illegible] coincidence summation [illegible] backscatter [illegible] X–rays.

[illegible]

.ʊÊŁəÀäã ʒÎţã ÆŁŸõʐÄõã ʒɳ isotopic (ÀəÀĮŢÄõã dɒɳ) ĞʌKŢᵩ ɹʐÓǩ ĞɢəÀìȉ ČʌÙ ŌÕǂǩ dɒȏ ȣʐè ĞŁəÀŁŁŁÓõã

Requirements for radionuclidic purity hʊyʃ\ DŽlƐ hʊĭᵠıĭ+lNjɑlƐ ɣNjƑsɑlƐ üШŬ lƑĠ+ƯʜDŽ

:ƙäʐŸèÙ ÆÊШ ĞĦÎţã ĞʌÆŁŸõʐÄõã gşÅÕÄõã ŌDZȷ ğÄĠŸÛᵠţã ǨÄȉȍŁ

ɾ ɹÙ Æz ÛĠʌåÅÀÄõã gşåÅʐǵã Ž ƤÀnÙ ĞÕʌÀÛª dɒĦĠʌ Ɓ Ån .ĞĦÎţã ĞʌÆŁŸõʐÄõã gşÅÕÄŸõ ɔøᵩåȷã ƤʐᵠÊţã ɒȝ ĸĠĦᵠõÄª .1
ĦĸĠõ ĦʐŸᵠnã Ûȳʐʌåʐ Ôõã Æʌåʐʌ ȣÅÎÓȏ ȳäÆÅᵠèÅª ÙŁÊĠõã ÅnÅd Ʒ Łù âÅŁÕª dɒĦĦʌ ÅnÆÅȝ ÛÅnÅd ĞĦìÙ ƷŁù ƷŸᵠƐ
ÆĦÔõã dɒţ ¢ᵩÙ ÛCŸȝÙ Ìęʐɬ Å₺õş .¢ᵠŁǵŸò ǵÆɳ ĞʌÅŒ ǨʐŸª ÖÇę ȝÎţã ÆŸŁõʐÄŸõ ÈĦÖᵠã òʐŸHʊ₺Ÿõ ƁØõã Õõáª dɒȝ
.ĞĦÎţã ĞʌÆŁŸõʐÄõã gşÅÕÄŸõ ɔøᵩåȷã ƤʐᵠÊţã ÖDZȷ Ğęå ÄŽõÙ ğÄĠŸÛᵠɳ ȝìş
ÆəäʐÎõã ĆØŁ ÖŽɳ ÛĦɳƷ₺ȝ .ĞʌåÅÀÄõã ğäşåÅʐǵã Ž ĞŁȝʐÄõã ĞĦÎţã ĞʌÆŁŸõʐÄõã ÆəäʐÎŸõ Ʊ₺Ţȝȷã ƤʐᵠÊţã ɒȝ ĸĠĦᵠõÄª .2
.197– ĘĠəÂõã ÄRHʊᵠÊɳ Ž 203– ĘĠəÂõã ÛĦŸŽɳ Ûgåȷţã ŽÄᵠᵩÙ ǒÄÄᵠÙ ÄƬŢǨ ɹÙ dɒǑ₺ţã dɒɳ ÅŒÙ ȣşÄĦţã ÕŸǨ Ʊ₺

ĞʌÆŁŸõʐÄõã gşÅÕÄõã ɹÙ ɹÅ₺Rõ ĞŁʐÅõ Kd ÅƬÊÄᵩ Ʊ₺ ÅŒŭʐ ÛĞʌøşÄŕ ÄõÓõã ĞÄᵩɇã ğÄĠŸÛᵠţã ɳÉĦǨ Å₺ÆÆª ¢ᵩÙ Ǵŕäʐõã dɒɳ
ĞòÅnş ÛŌŁÔÄᵠõÅª ¢ǨÄDzᵠÄɳ ÒHʊÄʌ ɹÙ ƷÔţã ɔŸȝ ĦĞDZʐᵠɳ ɔÕĞʌş .ƁÄÎĞõã òÅ₺Ħᵠèŕã ÕDZȷ ĞŁʐÅõ ÄRHʊᵠÊ₺Ÿõ ĞĦÎţã
dɒɳ ĞĠèÅʌɳ ğÆɳ ÆĦª ÄŁŁĦõã ĞŸʌzù ÆəäʐÎõã ɒȝ QHʊĠŸõ ÄŁŁĦõã gKÔę ĞĦÎţã ğÆŁŸõʐÄõã ğäÄRHʊᵠÊɳ ÒHʊÄʌ ɹÙ
gşÅÕᵩ ğäæ ßßäʐɳ ɟᵠʌǨ ĞɳÆÅᵠÊţã ƷÆÔᵠõã ĞŁŸ₺ȝ ɹüª ƷʌᵠÕʌ ɹÙ ¢ÊÄᵩ ƷĦÔŁŸõ ɒÓƐ ÛāʐŸèȷã ãØŁ Žş .ƱÌŸᵠõã
ƁÀəÀŁÄõã şÙ ƱəÀŁŁŁÓõã ÆŁŁÕÄᵠõã ƙŁĦᵠª ğäÄRHʊᵠÊţã ŔĦĠõ ƷÎţã ƁÆŁŸõʐÄõã ÆŁŁÕÄᵠõã dɒĦĦŁ Û î Åȉ ÕÒÎª şƐ .Ğ₺əŸɳ
batches ğÅĠŁDZş ȳÆÅᵠÊǨ ÅɳÆÅȝ ĞŁĠʌÀΘ ğäÄRHʊᵠÊɳ ȝÅᵠᵩßª ĠÔʌŁş ÛğÅᵩşÄᵠʌóª ǨĦĦÌ Ʊøᵠõã ÛĈʐÆƬᵠÊţã gåÅ₺Ÿõ
.ĞʐÆƬᵠÊɳ gåÅţ gÆʌÆDZ

hʊĭəFĭDŽĭ|ʃƐ hʊĭYƑʏ\Ü̈Ɛ ƳNjƑsɑlƐ DžĭĭyŁ

Determination of Radiochemical Purity

ãäÀÎᵠèŕäş ĞÕŁęÀõã ĞÕĠÛõã ãäÀÎᵠèäÙ ƱøᵠÕʌÀù dɒÒşş ÛĞȝʐᵠɳ ȧÀÛª ĞŁəÀŁŁÓõã ĞŁȝÅĦÌìqã gşÅÕÄõã Ğèäøå dɒǑ
ÙÛÁţã ɔŸȝ ĞŁȝÅĦÌìqã ţäʐǩ ÛÕÔÄõã òÅ₺ÓᵠèÅ ÆĦª ĸĦşş ÛĞòÅn ĞŁZÙ Åĸäşé ÅZ (76-72 ğÅHʊÀÔõã ÀŢᵩã) Ʊęøʐõã
gKĠÓõã ĞŁèÅÊΣã ÆĠÊª) ßÆDZ ßK8ò ãäÀÎᵠèŕã ÙÛƯ ɔŸȝ ǨÕÛţã gåÅţã ɹàş ɹʐÓʌ Åɳ gåÅȝş .ƱøäÀÎᵠèŕã
òÆª ȳäÆÅᵠèÅ dɒǑ .artifacts ğÅȝåÅᵠţÅ ÒĐÎᵠª ĘŸĦᵠʌ Åɳ ĸÊÄǩ Ž ĠòÅn ĠÅÅȝ Ʊnʐǩ Æzş (ĞŁȝÅĦÌìqã Ʒ ÎÓõ
carriers ĞĦ₺g ĠʐÅŕÙ ɹǔz ÛĦÅᵩÙ ÀõĦª Å₺õş .(99-96 ğÅHʊÀÔõã ÀŢᵩã) ÕÔÀõã ÕDZȷ ƱøäÆÅƬÓõã ɹƳgÀõã ãäÀÎᵠèŕã
ÛgÆÆÄɳ ÆĦÅ₺ƬŸõ ÅŁåʐDZʐª ¢ᵠÎţã ÆəäʐÎõã ÅƬÊÄᵩ ĞĦÎţã Ġʌşåȷã dɒɳ ÕÓõ (ĞĦÎţã Kd ĠÕʐäʐţã ğÄĠõÀţã ÛÕǔɳ)
ĞŁȝÅĦÌìqã ĠĠəÅÎõã ȝɳ ÀᵠǔᵠÅ ÆÕʐ ȝÎţã ǒäşÆŸõ (ÕÙäȝ) ÙŁÎᵩ Kd ÕɳÅg ȣÅÊʌ ÅɳÆÅȝ gǿzÛn ÛÕõáª ȝɳ ÛõÕÄŁş
ȝÎţã ǒäşÆŸõ ƱDZʐòʐĞõã ţäʐᵠõã Æòó ƷÀᵠÕǩ ƤÀnÙ ĞÕʌÀù Ġᵠ .ÆəäʐÎõã ĆØŁ ÀʌÆÉÕǩ ÕŁŸÕǩ Бٌ Ƀåúʌ Åư ÛĞŁəÀŁŁŁÓõã

[illegible]

[illegible]

Determination of Chemical Purity

[illegible] Preparation [illegible]

[illegible] 131 [illegible]

[illegible]

Tests for Sterility and Pyrogens

[illegible] Tests for Sterility [illegible] release [illegible] retrospectively

Sterility tests [illegible]

[illegible] indicators [illegible] sterilizers [illegible]

Pyrogen tests [illegible]

[illegible] (155-153 [illegible])

!ĭķɛþШ⊧ǁ hʊΘĢF I üDŽƐNjY hʊʒF Ţd

Addition of Bacteriostatic Agents

ÆĒŸÛǪʌ .ĞÁŸǪƯ ğÅęşŮ Ž ĞŁƀÅǪǪɳ ğÅʒÀƁZ ÆĦʊÊă ĠŧÊǩ ŦÒò ĞɳʒǪƯ ğÅʌŞÅģ Ž ģǻÅ3 ĞĤÎţă ĞʌŞǻ̊jă ɗĎĎģ ǻ̊ø̊zǩ .ɭəŸɳ ÂŁŌÀǪæ ÆèÀʌɳ ɭĘǪăÀDzŸŏ ĠăÅõ ŌɳÅ3 ɔŸ3 ɗŌΣă ĊØŁ ŌŽɳ ƁzǪƠ ɹüæ ƁşÆüă ĞʌŞǻ̊jă øzǪèǻ̊ ā ÀÁĞǪäă òɳÉĤɳ ÆŧǪ℞ʌ .ĞŁəÅţă ŌĘŌÅ⊧ă Ž ţÅĤìqă ĸǪüǪæ ǾŁzøÆǩ ɭĘǪăÀDzŸŏ ĞɯÅÒüă Ōnǯz℞üă ɗɳ ÆʌÆĤüă ǻ̊Å3 ā ÀÁĞǪʌ Ƶòş Ǿŧəäǻ̊ ǾʌÒư ÈĘŏ ÕŏØŏ ¢ǪŮş .òzŸHʊŧŸŏ Ʊ3ÅĤìqă ÂŁõÀǪäş 3Îţă ÆĒŸõzʌüă ĞĤĘĠù ɗŧŘǪǩ ÛŌnǯz℞üă ɗɳ ǻ̊Æ3 ɔŸ3 ĸɖ Åɳ ŌɳÅ3 ĞzÅrÛ ÆĤǩ ğäÀŘHʊǪÊţă ŘĤĠŏ ĞĠÊʌüÅäş 3Îɳ ŏäşǻ̊ Ƀŭ ɗɳ ĞʌǾĤɳ ¢ʌŌģ ŌDZj ɭĘǪăÀDzŸŏ ĠăÅõ ŌɳÅ3 ÛɭĘǪăÀDzŸŏ ĠăÅÒüă ŌɳÅĤüă ĞĤĘĠù ɗǾǩ ɹŮ Æz .ǾɳǯÂüŮ ÈĘŏ ɭĘǪăÀDzŸŏ ĞɯÅÒüă ŌnǯzĤüă òÅŧǪìă ɹůz ÆĠÊüă äØTş ÜĞăzɖÀɳ Ƀzʊơ ɾş Áģäş ȳzʌ ɗɳ ÀǰõŮ ÅŦǪĘģŸò ŏÅŦǪǪă ɹÅɳǎŮ ƱøǪŏä ĞĤÎţă ĞʌŞǻ̊jă ǻ̊ø̊zǩ ɹŮ Æz ÜĞęÅÔǾŏä ɔŸ3 ÛÆDZǩ Åɳ äæŮ .Ğʒǎɔă ģǻ̊ÀÅɳ ğÅʌŞÅģ Ž ŌŘÅɳ ŌÒÎă ɭĘǪăÀDzŸŏ ĠăÅõ ŌɳÅ3 Ƀŭ ɔŸ3

njþɋc l ƑĠ⊦ƯǾDŽ

Other Requirements

ĞʌŞǻ̊jă ø̊zǪèǻ̊ Ž ɗŌΣă ŌDZj ĞęŸĤŏä ğäé ğÅĞŸÛǪţă Ƀŭ ǾʌÔģ ɔÛĤǩ ƱøǪŏä ĞĤÎţă ĞʌŞǻ̊jă ÆĒDzǪÊǩ ɹŮ Æz .Ğʒǎɔă ģǻ̊ÀÅɳ ĞʌŞÅģ Ž ĞʌÔŌΣă ɭDzɯ ĞĘʌĤţă ğÅĞŸÛǪŧŸŏ ʒŘơ ɾ ÅŒŮ ŏÅŦǪèÅæ ÛƁşÆüă

hʊĭΘűTǁɛ ƀƑNǾĦŒɛ σĭþƑĦ

Expiry Date

ÅŁÆĤæ ĠÔʌł ɾ Û(ĞŁģŸÔŏä ŏÅŦǪǪă ÑʌóÅǩ ş℧) ĞŁģŸò ŏÅŦǪǪă gÆɳ ¢ŏ ɗŧĤł ɹŮ ʒÎţă ŏäşÆŸŏ ĞòÅ⌊ă ĞĤĘĠÛŏä ÆĒŸÛǪǩ ɗŧĤł ɹŮ ɗÒƐş ÛĞęÅÔŸŏä ɔŸ3 ĞŁʒÅĤìqă ɗʒ ¢ʌz ÀǪĤł BØŏä ÑʌóÅǪǪÅæ ĠʌĤĤţă ĞŁģŸÔŏä ŏÅŦǪǪă gÆɳ ÛÆĠǩ .¢ŏÅŧĤǪèă óäÀŧǪèÅæ ɗʒ ĞŁģŸÔŏä ŏÅŦǪǪă gÆɳ ÆʌÂǩ ɾ Ûòzùɹă ÀŁĤŏä ğäé ĞĤÎţă ğäÆĒŸõzʌŸŏ ĞĠÊʌóÅæ .ÀŦÌìɹă ş℧ ʒŁæÅèɹă ş℧ ȳÅʌɹă Ğ0ɾÆæ ğäé ĞĤÎţă ĞʌÆĒŸõzʌüă ĞĠəÅÎüă ɗɳ ʔzǪ⊦ă ɔŸ3ş Ʊəǻ̊ŧŁÒüă ţÅĤìqă ğÅĠǪ ɔŸ3 ĞŁģŸÔŏä ŏÅŦǪǪă gÆɳ ÆŧǪ℞ǩ .ÀŦÌì 6 ǪŁģ ʔÆɳ Ƀ℧ ǨÔęÅǩ Æę ĞŁ3ÅĤìqă ɹzÒǪè ÛĞŁģŸÔŏä gÆɳ ĞʌÅŒ Ž .ǿÅĠǪ3ɾă ÆĒę ÀŘHʊǪÊţă Ž òzùɹă ÀŁĤŏä ĤǨ℧õ òÅĤĤÅŏä ɹzÒţă Ğ3ÀDZ gÅʌÀ ÆDZzǪʌ ǪŁģ ş℧ gÅzÔÕţă ĞʌÅ8ŏä ȳÆÁǪŏ ĞŁzÅõ Kɖ ĞŁÕĠǪţă ĞŁ3ĤÌìqă ĞʌÅŒ ¢ʌz ɹzÒǩ gŞÅÕÅŏä ÒÕĤł Æę Ʊ3ĤÌìqă ş℧ ƱəĤŧŁÒüă ÕÒÀǪŏä ÛÕŏØŏ ĞzÅrÛ .Ğæzɖɳ Kɖ ĞĒDZzòzʌÂĒz ğÅæÅDzǪèă ǫÆƠ ǪŁģ Ğ3ÀɔǎɔĤ ɹŮ ÕÒÎă zŁ ĞĤÎţă ĞʌÆĒŸõzʌüă ĞĠəÅÎüă ʔzǪŢ ɹzÒʌ Æęş .¢ʌz ãzɖɳ Kɖ ʔÆɳ Ƀŭ ĞŁəÅŧŁÒüă ĞŁ3ĤÌìqă .ĞǿzĠÕɳ Kɖ ŘʌÀŧŸŏ ɔÛĤǩ ɹŮ ô ÀǪÅţă ĞŁ3ĤÌìqă

Labelling

:(vial òÀÆÅóã ÛĦŸĴŋ) dzɀȓɀƨş gÀȓÀǤŋ ĞʌşÅΣã ɾŸȝ ĞÆõÅǪõã ğÅŋɀŸĦţã ÀȚŢȒ ɹǔ ÛĦŋɀƭȝ ÛÆDZɀǪʌ

1. ÜÀȒĦǪÊţã ɻèã
2. Ü3Îŋ ÀȒĦǪÊŋ ɀŁ ÀȒĦǪÊţã ɹǔ ɾŸȝ òÆǩ gøÅǤȝ
3. Ü3ÆʌÔǪõã ɹÅÒŋş ȝǂÔţã ɻèã
4. ÿÅʌɟã dbĞǤǩ Ħŋɀʌ 30 dbŋ ÀĴõǔ ƬÁÔǂõã ÀƚĦõã gÆŋ ɹɀÒǩ ÅŋÆA3) ĞȝÅÊõãş dbĞƭţã ÑʌǿÅǪõÅã gåɀDZɀţã ĞÆŸÒõã ĞÆȝÅĦȉìqã
Ü(ÙÕɀ
5. ÜĞÆgŸÔõã ǒÅȚǪǂã gÆŋ şǔ ĞÆgŸÔõã ǒÅȚǪǂã ÑʌǿÅǩ
6. Ü(ĞŸÆ8ÎǪõã şǔ ĞǤÆDZɀõã ɻɇé Ûòȷ̊ţã ÕĞǤè ɾŸȝ) ɟǪƱţã ÑʌǿÅǩ ÀǪǔ ǒÅÅǪɇã ¢ǒŸƞ dbŋ dbÒƐ ǪÆШ ƤÀƞǔ Ğǒɾå şǔ ɻɇé
7. ÜòɀŸƬƱŸõ ƬŸÒõã ɻDzΣã ÛÕĞõÅ∔ã ĞõÅg Ž
8. .ǒɀȒõãş góãÀΣã ĞDZǿÆã ĘŸĦǪʌ ÅƚĦz dbʌÅÅǪŸõ ĞòÅɁã ğÅǤŸÛǪţã

ÛĦŸĴŋ) ĞĖŸÒõã ĞÆȝÅĦȉìqã ƙĞǩ ƬøǪõã góÅǤĦõã dbŋ ŋɾÆã ȝÎţã ÂÆõÀǪõã dbĞǤǩ góÅǤȝ ÀÕØǂ ɹǔ dbÒƐ ÛòɀŸ∔ã ĞõÅg Ž ĞȚgŸŋ
.(òɀŸ∔ã dbŋ Õŋ 1 Õõ Ž MBq ÕʌǨÒÆã Å8Æŋ şǔ (mci) Ƀóɀõ ƬŸÆŋ

.ƬDZǿÅɁã ɻÆèzǪõãş ĞÅǤĦǪõÅã ĘŸĦǪʌ ÅƚĦz ĞòÅȵ ĞÆõşå şǔ ĞÆAùş ğÅƚÆȚĸ Бǔ ĞĦÎţã åãɀţã dbƬìȝȒƐ

DžĭȒǪɟĦIJ

Storage

îşÀì ɹɀÒǩ ɹǔ Æz .ĞʌÅ8õã ǾØT ĞʌĂĦŋ ĞgÅã Ž ɹÂơ ɹǔş ĂÆEDZ ĞÕŸ8ŋ ğÅʌşÅg Ž ĞĦÎţã Ğʌşåɟɟã ŞÅg Æz
.òɀǤÕţã ƤɀǪÊţã Бǔ ĂȒãÅåŋ î ÅÅìɟã ÅT ô ÀĦǪʌ Æę ƬøǪõã ɾƚȚĦõã ţÅĦìqã ĞȝÀDZ òÆĦŋ ɹɀÒʌ ǪÆШ dbʌÂÅǪõã ĞÆDZÅDZÂõã ğÅʌşÅΣã ɻǪĦǩ ɹǔ dbÒƐ .dbúţã ţÅĦìqã Æȓ ĞʌÅƚΣã ÕDZɟ ĞÆAùɀõã ğÅƚÆȚĸǪŸõ ĞãÅDzǪèŸõ ĞʌÅĦõã Ƭnɀǩ Æz
.ţÅĦìqã ĸǪũǩ ǨƠ

POWDER FINENESS AND SIEVES üIJFĂDŽIJĖNj 5ĭΘƑƨDŽIJĖ hƱDŽNjyĂz

Powders 5ĭΘƑƨDŽIJĖ .A

dbŋ ÃƐ ɹǔ ȧɀHƱÊƚŸõ dbÒƐ ƁØõã ÕÅʌţã ÆÕǰõ ƬƧɾã ĞHǪʌÅõã ɻDzШ ȧɀHƱÊŋ Ƀǔ ĞqɀÎn ĞDZóå ȧĦÅǂ
.(µm) ÀǪŋşÅÒţʌãɇ ¢ʌȝ ÀƱĦǂ Ûȼǒŷn

:ĘĿgÅÊţã Ɀòş Ž ĞÆõÅǪõã ğÅHƱŸÛÔţã ȳÆÅǪÊǩ

[illegible] .(2000/355) *Coarse powder* [illegible] 2000 [illegible] .355 [illegible] %40 [illegible]

[illegible] .(710/250) *Moderately coarse powder* [illegible] 710 [illegible] .250 [illegible] %40 [illegible]

[illegible] .(355/180) *Moderately fine Powder* [illegible] 355 [illegible] .180 [illegible] %40 [illegible]

[illegible] .(180) *fine powder* [illegible] .180 [illegible]

[illegible] .(125) *very fine powder* [illegible] .125 [illegible]

[illegible]

B. Sieves [illegible]

[illegible] .(µm) [illegible]

[illegible] .(2 [illegible])

Wire mash sieves [illegible] **.2** [illegible]

[illegible] **Approximate screening area (%)**	[illegible] **Nominal diameter of wire (mm)**	[illegible] **Nominal size of aperture (mm)**	**Number** [illegible] **of sieve (µm)**
2000	2.00	0.90	48
710	0.710	0.450	37
500	0.500	0.315	38
355	0.355	0.224	38
250	0.250	160	37
212	0.212	0.140	36
180	0.180	0.125	35
150	0.150	0.100	36
125	0.125	0.090	34
90	0.090	0.063	35
75	0.075	0.050	36
45	0.045	0.032	34

ÈǂǂǑǫǿǟ ǴŧŢǺŋ ǿǺǂȞŋ ȸŋ Ǻŏ ɂȍɀţ ǬǮ ƙǽ ȸŋ ɄÊǂǝǿ ǑȮÎǽ ǴǂȮǮÊǿǟ Ǒǹǻţǟ ǡɀǑǭ ǴǶǫǺǿ ɄƧɍǟ ȴǄΣǟ ɂǑǻǟ

.ISO – standard 565-1972 ǴǂǿȘǼǿǟ

PHYSICOCHEMICAL METHODS ƕĭəƑĭǅĭǀǁɛ ƕĭəƑĭɌĭƻǁɛ ƼƥƯǁɛ

CHROMATOGRAPHY [illegible]

mobile [illegible] solute [illegible] partition [illegible] adsorption [illegible] .stationary [illegible] coated ([illegible]) [illegible] .gel permeation [illegible] ion exchange [illegible] (solid support [illegible]

[illegible] separation [illegible] detection [illegible] identification [illegible] ."chromatographic method of analysis [illegible]

[illegible] planar methods [illegible] .(paper and thin-layer chromatography [illegible]) adsorbent [illegible] .(high performance liquid chromatography [illegible] solutes [illegible]

[illegible] identification [illegible] separations [illegible] determination [illegible] detection [illegible]

.ÅMøäÀág ĞQæÅò Kq ęÙ gøÅÆùù Kq ğÅ¢õÀą ŲŁ ğÅ¢õÀtä

hʊšɪɜƥllɛ hʊɜĞŮ'llɛ ƒɛƥ]ɬƨɛ

Thin –layer Chromatography

ļŸą 0.24 ĞφÅÁŽæ gÅÅ3) ĞÊφÅDzQą ĞÕÆęø ĞÕ¢ùù ф3 gøÅ¢3 ĞÕÆęÀää ĞÕ¢ÛäĀ ãäÀÎQèä Ž adsorbent gÂQŧtţä gÅÅtţä ęÙ ȳzËĦnzȯjä ơą Ğęʌęɸ ęÙ ĞEDZÅDZà ĞHuŁÅò ÕŽą ÛĞGŸò Ğnĵ3å ɔŸ3 ĞÕÕGÛħ ĞnzĤÆæ ĞęzHʊÊą ĞzÅDZ gÅÅą ơą (ÑĞMÀÄÕK (capillary action ÐÀĤÎää ÕĤÂôÅæ gÅÅ3) ĞHuŁÁÔää ÁÛè Ǝ3 öÀHʊQʌ ɹÙ öÀHʊQŧä øzÛŸö ÁŧÊł .plastic ÕQèŸ¢ää ɔŸ3 ßÅÅŧQ3ä ÛÅŧŦŁŸõ ơą ĞÅËözǩ ęÙ partition ļèÅÕQôä ęÙ adsorption ÀäÂQnŗä ɔŸ3 ãäÀÎQèŗä ĞŁŸŧ3 ÁŧQĤǩ Áęę gKDzg Ž ãäÀÎQèŗä ğäöäÀDZÛ gÁą ĞŸŁù ÛĞHuŁÁÔää 3ŗzǩ .ĞnĵÁQÊŧä ğÁ¢MØţä ĞĤŁ¢ùę ÅŦQɔÅĤnę gĦQŧŧä gÅÅtţä gÅÅ3 ʊøQää Û(ĞHuÁÔää ɔŸ3Ù ℃ÅΘÅæ õÀHʊQŧä øzÛää ĞõÀg ĞφęäÀą Ášŧ£ʌ ʊÒò ǯÅDZÂää ơą gÅÅ3 Ğ3zÅÔnĵ ãäÀÎQèŗä ÀŁzɾɔä È£õ ÛSilica gel ÅÒŁŸŁÊöä ĞnĵŸŁ ĤĢöÅdę ʊŦz ĞnĵÁÁQÊŧä ĞGŸÔää ļəÅ3Áää Ånĵ .ÆMØţä óÅÁG¤ ĞĤ¢Îĥ ɹzÒǩ Ån ò¢ŽţÅ ÒŁφè ɔŸ3 ÛĞŧəŸą ĞnĵÅ3å ÅŦŦöÛ 8ÅŘł ɹÙ ơÒƐ Ûcellulose àzòzŸÊäş Ûalumina ÅÆĥzȯjä ÛKieselguhr åäzη prepared layer gÀŘ÷ä ĞÕφÛää ãäÀÎł ɹÙ ơÒƐ .ĞHuŁÁÔää ɔŸ3 àÅÔQö¤ä ÂÀÅĤǩ ÕDZj ȳzŁÊöÅÒää ğÅÅŸè 8ÅŘł î äzn ÕMÆĤQò ĞŦĐZzą ÛĞŘÅää ğäÀQφ Ošą ÛƤÀnÙ åäzη ęÙ Ûbasic ĞÀÆ3ÅęÙ ęÙ ĞöåÅĤQą ęÙ ĞŒŘÞ ğÅÕφÛù Kzzǩò Ğøßäå ğÅÕφÛää ơą 3èäzöää òÅÖä äØŁ Ášŧ£ʌ .ɹzÀQò ĞöåÅĞĦ gÅÅą ơą Ûğ¤ÅΣä ŘĤä Ž ÛĞÕφÛää ɹzÒǩ .gÀŘ÷ä ĞÕφÛää ĞÕφÛää ãäÀÎQèä ơą ÕĤz Åư ÕÔÅää gzÕö ĞĞMÀÕǩ åęÆŢ ¤ ÀĮßQæ ÛĞÁŸQƯ ğÅ¢MØą ļŢł 3ą ɹÀÀQę¤Åæ ĞnĵÁÁQÊŧä ÛgÀzäzQŧä .ƲøQ¤ÆŒÔää ÕŒŸHuQää Ž gÆŒÅţä ĞÕMÀÛää ĞÕ¢ęÀöää

ÕDZj ȳÆÁQÊł ɹÙ ơÒŧ¢z Ûidentification (ĞÀzTä ĸ¢ĤǩĸÙ 8äÀĤQèŗÅæ ĞÕ¢ęÀöää ĞÕφÛää ãäÀÎQèä ɹÀÀQęä Bٌ ĞzÅŕÙ ĞÕQzĦą ĞÕ¢ÕĝĞ ĞÆ3 ɹzÒǩ Ån gÅÅ3 Ûstandard ĞÀÓÅŒĤą ŒĤĸĦ ʊøQää gÅÅţä ÕŸǩ 3ą ÅŦQÀzŁ ĸ¢ĤǩĸÅäÀţä gÅÅţä õzŸè ĞφóÅÕą ÆÅ3 ÛɹÅǩÅţä ǨõÀƠ Ån äæÙş ãäÀÎQèŗä ĞŒŸŧ3 öÅÀQÙ ĸQŸQÅŧQą ĸQzÅÊą ɹÅǩÅţä ǨõÀƠ Ån äæÙ .ÒHuÀöä ÆŒę gÅÅŧŸõ äØŁ ƧzÕQÀş .ɹÅQŸQÅŧQą ĸǩÅÅţä ɹÙ ôÀQÀł ¢φüz Û(gÅÀÀĦ) gÆégäş gÅÅŧõ ÛãäÀÎQèŸö ÅŧŦ3ÅŘnÙş ÅŧŦŘĤæ 3ą ÅŦDZÂą Ž ŒŸQÅŧQą ŒõzŸè ɹǩÅą ǨÓŸè äæÙ ÛŒnzŧ3 ÜãäÀÎQèŗä ơą ZŸQƯ ȳÅŢφ ȳäÆÁQèÅæ ğäöäÀDZqä gÅÅ3ăæ ôäÀQzŗä .ŒÆDZ ŒÀzę ĞÀzTä ôäÀQzä ÁφÔŒz ĞÀŸQƯ ĞŁèÅèÙ ļŢł ĞφŸQ

ĞφÊφ ĞzşÀĤą Ką gÅÅą ÅŦõÀHuQǩ ƲøQöä ĞŒφÊÁöä ĞzÅÊŧä ÆMÆƠ (ĞÀzTä ĸ¢ĤǩĸÙ 8äÀĤQèŗä ğÅÅą ÕDZj ļəŸŧä ơŧ ¢φÙ ÙÛÛƯ ƲÅz .ĞÀMØÅŒĤŧä ĞŒĤƊZÀŧä gÅÅŧä ÅŦŦĤÛÕǩ ƲøQöä ĞzÅÊŧä Бٌ ęÙ ÆMØţä ĞnĵÆÕą ÅŦŦÛĤǩ ƲøQöä ĞzÅÊŧä Бٌ Ånĵ ĞzÅΣÅæ Ğ3zÛÕŧä ĞzÅÊŧä Бٌ ĞφÊφ ơŒĤą ÆõÀţ gÂQŧŧä gÅÅŧä ɔŸ3 Ğ3zÛÕŧä ĞzÅÊŧä 8ÀĤĸ ÛÆõÀą Bj ãäÀÎQèŗä ȳÅŢÁöä Ž gÅÅŧŸö R_f ĞŧŒÕõ ÛøÅQÀnŗä gÅÅą ĘĞÛǩ ĞÛÕφ ơą ðäÆQöä ÅŧŦŦQŸõ ĞÊŒÕą Û(õÀHuQŧä øzÛää ęÙ) ÆMØŧŸö ĞnĵÁÕQŧä ɔŸ3 ĞĤĞŧä ĞŒĤƊZÀŧä gÅÅŧäş ÆõÀŧä ơą ĸQ3zÛÕŧä ĸQzÅÊŧä ĞφÊφ 8ÀĤĸş .ĞŒĤƊZÀą ĞŧŒę ŲŁş ÛĘĦÛŧä ƲøääÀÎQèŗä

ΨÛĤǩ QƐШ ĞÕƐęÆõä ĞƐGÀDzQõä ŝşÀÎŸõ ЙÕzş ȣKGõ ЙzŸQnä ZŸQơ ȷŮ R_f ŁĻƐÕõ ȸÒƹ ÛĞƐŸŧĦõä Ğèǿȧŧţä Žş .R_r Ğŧ£ę ÅŒŮ .ÀǰõŮ ȦZŦŸ3 òzĦę ĞȦáÆ3 Ğŧ£ę ¢ÊȦφ ǴÛÊõä ɔŸ3 ȦT āäÀÎQèɾä ðäÀDZŮ Ź ΨøQõä ĞƐĦDZÀŧţä gáȦţä ÕäȦÕn ĞȦȣĦţä R_r Ğŧ£ę gáȦ3 ȳÆÁQÊţä ðäÀDZqä zŁ ȣǾŁş ℂΥ3Ů ϑzòzn zŁ Ȧŧõ ĞƐÕƐÕǵ ĞȦȣ3 3n ĞφǿȦÕţä ΨŁ ÛÕõǽ 3n ÛÕȦzĦQõä dbn ÀǰõŮş .ĞȦşáȷä ózQèå ǧȦȦdę ÕDZȷ

āäÀÎQèɾä ÙÛÚ ĞɔȦĦn gáȦ3 ƁøşÀŘõä dbţ ¢ůz, óŻÛĦ ΨøäÀÎQèä ÙÛÚ ɔŸ3 ĞφŻŸĦ Kq gáȦn 3ȩzn kƐĦĶ ĞƐ8ä ÕäȦę ÆèȦȦn ÕȦÆä ōȦȦŁş .ĞÕõůQn şŮ ĞφŻŸĦ ǧȦÕQÎn Бŭ ȦZĞŸę şŮ ĞŸÔȦŧţä áäzţä Char 3ȦÈ ȦnŮ 3ƐÛQÊȦ Z ìȦõ 3n ȧzz ĞĦìȷä ŏz r ǨƠ ÒHυȦõä ÆȦ3 gzÕä ȩĞõůǨ gáȦn āȦÎĦ ǴÛè ɔŸ3 āäÀÎQèɾä àȦƟŮ zŁ ßǿäÀÒǨ ȩƐGÛQŸõ ÕÒì ɔŸ3 ȳÆÁQÊţä ĞDZzţä ozÛä ĞĦìȷä Òǫ Ψøǫõä áäzţȦä ĞŴQHuţä ĞHυƐÀÔõä ǧȦǵȦä ÀZŢǨ .ĞDZzţä gǨÔę ĞƐDzÊȦAGõä ϭ3 ZÎÒõä Ûȯȧǰţä ÕƐGè ɔŸ3 ÛÀZnąÆÁQèä ϭÒƐ ϑȦĦQŸõ ÕəȦèş Ğǫ ÚĞòȦn ǧɾȦǵ Ž .ĞÕõůQn ĞƐAŸn ɔŸ3 ĞQÅ3 3Õä ÆƐę ĞȦzƐΣä ǧäáÀÎţä ȷzÒǨ ǪƐǵ ĞƐDZzȯzƐȩşÀÒţä ĞȩȦDzQèɾä şŮ ǨŸÔȩ Æę Ğnzèzţä ǧȦGÕÀţä ȷzÒǨ ǪƐǵ ĞƐ3ȦĦìqä .ĞèäǿÆõä

ǧȦzQÊţä ÀȦÆÕQõ ĞŸƐèş Kzzǩ ÕDZȷ zŁ ΨøφɾÆƐÔõä ÕŧŦõä Ž ĞÕƐęÀõä ĞÕĞÛõä āäÀÎQèr Ğ£ę ǰõȷä òȦŧĦQèɾä Ûāäȧ ÎQèɾä àȦƟŮ ÆĦȩş ÛΨøäÀÎQèɾä ǴÛÊõä ɔŸ3 gáȦţä ȨƐÛĦ ĞȦ8õä ǿØTş ÛĞƐĞÛõä áäzţä Ž Æəȩz Îõä dbn ĞŔÀÁȦţä ȷDzΣä ǪƐǵ dbn ĞĞèȦȦn ĞÕȦÀÛä ȷȦƐĦŸõ ȦŁǿȦƟşŮ ÆĦȩ āäÀÎQèɾä ÙÛÚ Ž ƤÀĶ ȷŮ ô ÀQȦţä ĞȦzφȫǫ 3Õä Ƀŭ ȷǿÁÕĶ ĞĦυƐÁÔŸõ ΨøäÀÎQèɾä ǴÛÊõä ɔŸ3 ĞŸŧĦuţȩş ĞĦęzǫţä Æəȩz ÎŸõ gÆəȦĦÕõä ŔÀÁȦţä ÂƐÕÀǫõä ǧȩä 3ÕĞõä ÕŸǩ 3n gÆÎõȩş ÆŸÛǫ ǧȩşáÀzǵȩä ŔĦä Žş gÀzȩzǫn ĞĦęzǫţä Æəȩz Îõä ȷzÒǨ ȷŮ ǧȩõÀDZqä ǿØŁ ÕŷȵQǩ .¢ÊȦφ Ǩęzǫȩäę ȦZÊȦφ ǧɾȦΣä ǿØŁ ÕŷȵQ Žş Æəȩz Îõä ǿØŁ ÕŷȵQ Àzȩzǫǩ ɾ ÛgÆMÆ3 ǧɾȦǵ Ž .Æəȩz Îõä dbn ĞƐÕƐÕǵ ǧȦȦĦ3 òȦŧĦQèȩä Ànȷȩä ɔŸ3 āäÀÎQèɾä ØƐȦAǫä ĞΘȦÃõä ĞĦÕĞõä 3n gÆƐŁÂõä Æəȩz Îõä dbn üÎȦǩ Ψøǫõä ĞȦzφȦŷõä 3ÕĞõä ĞφǿȦÕn ĦĞõȦdę dbÒŧţä dbn ¢ůz, ĞȦÒư Ǩq (ĞŸƐèzõä) ĞŸƐΣä ǿØŁş .ÒHυȦõä ÆƐę gáȦţä dbn ĞĞèȦȦn ĞŔÀÁȦn loading Ğõzƥ ÿäÆÁQèȦä ȦZÊȦφ ĞHυƐÁÔõä ĦĞõȦdę Àzzǩ ȦZȦÒõ Ûrevelation óȦZŦşqä ĞÕȦÀÛõ ĞÀŸǫƯ òȦÒȦìüä ÆƐDzQÊǩ Æę ÒHυȦõä ÆƐę gáȦţȩş ÆəȩzÎõä ȷȷ Ħŧəáå ţȦzÆõä dbÒz QƐǵ QǫȦǫ õäÀDZŮ Ğǫ .ÒHυȦõä ÆƐę gáȦţä Ž ĞĞəȦÎõä ƤzQÊn ɔŸ3 ¢ǫŸn dbn ȷDΣä dbÒz ĦɾzĞÕn ßǿÁƐĦn äæŮ ĞȦzφȦǫ 3Õä ȦZŦţǩ dbõ ÛāäÀÎQèɾä àȦƟŮ ÆĦä ÛQƐĦ ĞòzHυȦţä gáȦţä ϭ3 dbĦĦn gõÆÕn ĘƐGÛǩ zŁȩ ℂÆƐΔûǩ şŮ ¢A3 ΨŁ ĞȦzφȦǫ ĞĦÕä ĞȦÚó ĞƐφȦÒnŮ ȷȷ QŸžõä àÀÛõä dbn ĦɾzĞę Õęɟä zŁ ðäÀDZqä ßǿȩş ÙòzĞõn ÕÒÎä ĞƐÕφ ĞȦƐĦõä ǨφȦõ ɔŸ3 ßáȦţǫ3ä Ànȹ Ǩęş dbn KGõ ÕÒÎä ZŸQơ Æę āäÀÎQèɾä ÙÛÚ ɔŸ3 3ÕĞõä gÆì ȷŮ ÆGÊäş ĞƐÔÁì ĞõÊn .āäÀÎQèŸõ ĞÕƐęÆõä ŝşÀÎõä

ĞÕȦÀÛä dbĦĦŻ ÆèȦȦn ÆȦØη gáȦţä ZÛìş ÛĞHυƐÁÔõä dbn ĞĦÕĞõä ţÂφ dbÒz ĞƐŧÒõä ǧȦèÆƐÕõä ǧäǿäÀDZŮ ÕDZŮ dbnş àȦƟŮ dbÒz ÛǧɾȦΣä ŔĦä Ž .ΨəȦƐŧƐõ Õ3ȦAǫä ĞɔȦĦţä ÆĦä şŮ gÀìȦGn ȦnŮ ÛΨəzÊõä ZƐÛõä âÆę ÕŷȵQ ÛĞȦÀÁÒä ĞèȦÊg

dbŋ ČΘȂȂõä ğäÆÎõä 3ŋ gÆÛŸö ČÕgŗ ČɸóȂÕŋ Ż ΨÊȂȂÀQõä ČzȂŽÒõä âȂÆÕŋ gÆ3ȂÊŋ ČŸÕCGõä gÆì âȂÆÕæ ΨtÒõä âȂÆÕõä .¢æȂÎŋ ÕÒÎæ Čɐ ȂĦŋŞ ȂTÊAɸ gåȂtŸö ČȂóȂÆĦŋ ğȂÆtõ

ÙÛƯ õÀQȂ ȂŋÆȂ3) åÆĦQŋ ÀȂzÛk õäÀDZüæ ĦɸȂÆgÜ ČÕÆęÀõä ČÕCÛõä āäÀÎQèÅæ ĦŘĦæ ȂTŘĦæ ȡ3 åäzŧä ÕÔz ĸÊƠ ȡÓz ȂŋÆȂ3) ÀtQÊŋ ÀȂzÛQæ şÜ Û(¢ÊAɸ āäÀÎQèŗä ȳȂŢĸö ČÆɸȂQ gÀŋ 3ŘÁł Ż ȡŋş ZDzÆõ chromatogram āäÀÎQèŗä ΨəȂQõ āäÀÎQèŗȂæ şÜ Û(adsorbent surface ¢ÂQtŧä gåȂŧä ĠÛÊõ ȂΨŸĦõä ĠȂȂTȂõä ȡŋ gäÀtQèȂæ ÀÁCQÆõ õÀHUQŧä ózÛõä õÀQȂ gåȂ3 ÛČÆɸȂQ gÀŋ āäÀÎQèŸõ 3ŘÁĸş ÛČtəȂę ĠȂşäÂæ ÆŸÕł Ż ÛZDzQõ ČÆääÀÎQèŗä ČHUÆÁÔõä õÀQk ȂŋÆȂ3) åȂĦæjä ǰəȂQɸ ĸÊÀĸ Ž óØΣä Ψnzĸ Æz .(ΨəÆĠõä āäÀÎQèŗä Ž ÕtĦèä ΒØõä Õõæ ȡ3 ZŸQƯ ÆȂØŋ ȳȂĮɸ ȳäÆÁQèÅæ ÚŸŽŋ gÆÊõjä KQüQæ ÛāäÀÎQèŗä ÆÆę gåȂŧä ÕÒÀĸ ɹj ÛČÛÆèş ZÆÐθ ğȂÆŸtȝ ȳÆÁQÊł ȂŋÆȂ3 āäÀÎQèŗä ÙÛƯ ääÚ ȂtÆz ɔŸ3 ɭÒΣä Ž gƎQĦŋ Čtęę ğäæ î Ȃn ÕÒÎæ åȂĦäjä ČÆəÀÀQ āäÀÎQèŗä ČÆŸtȝ ɐÉĦł .ČHUÆÁÔõä ɔŸ3 QÆȝ Æę ¢ȂΘä Ž Ż ȡŋş Ægäş ¢ȂΘä Ž ĦŗşÜ åäzŋ ǰȂÂŋ óɸzÙ Ȃŋ ääÚ .āäÀÎQèŗä óɸÛk ČÆŸtȝ ÕȂÁQÙ ΨəȂÆtŧÕ òɐÆGk ΒÜ QÆg ǰQÁk B ääÚ ČHUÆÁÔõä Ǝȝ ΒÀÛę Ùn ɔŸ3 ȝÕk ȣzè ČŸÔȂȂtä åäzŧȂz ¢ÊÀɸ ÆȂØŧä ȳäÆÁQèÅæ òşjä ɔŸ3 Βåzŧȝ .artifacts ğȂ3åȂn

ȡÒzş .Čtȝäå ČHUÆÁÒ ɔŸ3 ČɸȂÁǰõä ČÊɸȂDzQŋ ČÕĦęó ČÕCGù ÕÒÎæ gÂQŧŧä gåȂŧä gåȂ3 æÀŘ ČÕĦęÀõä ČÕCÛõä āäÀÎQèä Ž ČŸŴ8ŋ ĦȂØÊΘ gÀŘŖ ČÆääÀÎQèä dzzÛè ɔŸ3 òzÔΣä ɭəŸŧäş ȡÒŧŧä dbŋ ¢ȂÒòş ČÆŸÆŸHUQõä ğäƎQÁŧä Ž Õõæ ɭQȂ ɹÜ āäÀÎQèŗä ČÆŸtȝ ČÆèȂÊğ ɹÜ ÛŞΣä òzÊòş .ČÆɸÆĦŋ ĘəȂęó ɔŸ3 şÜ ÕĦQèŸGõä şÜ ǯÀDZÂõä dbŋ ÁəȂÀò ɔŸ3 (ČÆŸÛh) şÜ ȂTȂÆæ ȂtÆz òÁȂCQŸõ ĦtəäÁ ŸÆȂęÊ Kd ĦȂØÊΘ gÀzäzQŧä ÁəȂÀÔõä ¢ØŁ dbŋ ÕĦΘ ČÆGȂÀDzQõä ŗşÀÎõä Ž ČÁÆÁÛõä ğɾÆCQŸõ silica gel ȂÒÆŸÆÊõä ČɳŸŏ ČÊĠŸh ČHUÆÀò ɹÜş .ƎQÁŧä Ž ĦȂÀŁÅş ČŏĦÎŋ ČÕȂÀÛæ (ČÆŸÛŋ) ČÊĠŸh ÁəȂÀò ȝŋ òÁȂCQŸõ (ΨŸÛõä) ÈÆGŸQõä gÁȂŋ ȳäÆÁQèÅæ gÀŘŖş ƎQÁŧä Ž ČÊĠŸh ČHUÆÀò ȡ3 ČÁŸQƯ ÕÔz ğȂÀòäzŋ ΨÛĦÆę ÆęĦ3ȂÀò gÀŘŖ ÁəȂÀò ȂTGÊШ ȳÆÁQÊł ÛČŸŋȂõş ĦÕGÊŋ ÛgÀÒQɸ ÕÔÒÀŸõ ČÕȂÀù ɹÜ QÆg ČŸŷɳÜ ÆDZzĸş ÛČ3ȂÀÔõä Ž ČɳÆÁQÊŧä ȂTÊÀɸ Ψnzĸ Æz äØTş .ÁÆHUò ÈÒĦõäş ĦÕGÊŋ ĦȂ3ȂÀò gÀŘŖ ÁəȂÀò ȂTGÊШ ȳÆÁQÊł ȂŋÆȂ3 ÕÎÀĸ ƎQÁŧä Ž gÀŘŖ ĦtəäÅ ČHUÆÁÔõä Ùy Ctęŷh ĻÆÕĸ Æzş ÀnÚ Ùy Бÿ āäÀÎQèŗä ČHUÆÁÔõ dbĦŋ Ùy dbŋ òzHUQõä ÆA3 ÁȂÆÎõä ØØΣä .¢æ ȧzçzõä Õ©ę

Ž ČQæÀQ Kd ČòzHUȧŧä åäzŧä ĸɸȂõ Ȃŋ äæÚ ozRõä dbŋ āäÀÎQèŗä ȂTŁz ĻQȂ ΨøQõä ČÆääÀÎQèŗä gKDzΣä ČȂÀþ Æz ¢ɸj ÀìȂÁŋ ÕÒÎæ ÈtÎõä ČĦìÜ ¢ÆõÜ ÕÔĸ ŗ 3ęzŋ Ž āäÀÎQèŗä gKDzg 3ŗzĸ ɹÜ Æz Ûòȧzgjä Õõ Žş .ozRõä ğȂgȂGõä Ž ΒβúȂ Ȃư äØŁş .ČÆDZȂDZÂõä āäÀÎQèŗä gKDzg ɹäóÆDZ Ž āzŧ3 ÆGÊæ ČȂŸQƯ ğȂDZóÆæ ČĦìjä ÀÊÒȂĸ Æę .õÀHUQŧä ózÛŸö (óäzùjä ÆȂÀd) æȂì āȂÆÊɸä Бÿ ČÆääÀÎQèŗä ČHUÆÁÔõä ɔŸ3 góäÀΣä ČĦȂĸÀŋ

Ûprecoated ÈEGŸQöä ĞÕGÊḫ ÅŦAÒö ƎQÁţä Ž gÀŘHuḫ ĞĿäÀÎQèä ĞHuĿÀò ÿäÆÁQèä MÕgr gøzõØţä àÀÛöä ô ÀQÀǩ .ℭàÅƠŮ ƷɳÂŧţä î Å ļä ĘEGÛQöä Ɨɳ ĞɳƃŸḫ BÆGǩ ɹŮ ĞÛMÀì ÅŦɳäÆÁQèä ɒÒƹȘ ÛĦMøşÀr Õöæ ɹÅõ äæŮ ĞÛĦÎĦḫ :ɒɳ ğäÉĦţä ɹzÒQǩş

- ÜĞäzɋÀţä ĞɷÅÁžöÅæ ĠəÅÀÔöä ɔŸ3 (ÕEŸ8Qöä) ÈEGŸQöä gÅĦţ ĞɷÅÁžöä ĞÊɷÅDzQɳ ĞÕGù spreading ÀÎÅö gÂEŦDZ
- ÜĞEĦDZÀţä ÕEöÅ∓äş ÅŦÔHuz ãzŸÛţä ÕEöÅ∓ä åÆ3 Ɨřzö ąßÅõ ôÀ3ş ļŸɳ 200 òzÛä ĠəÅÀò
- ĠəÅÀÔŸö ÆèÅʌɳ ļDzg̊ ɒnş ÛŷÅÒgǩæ ĘŸ8ʌ öÅÛɋ ğäæ ÛžÅDZÂöä gÅĦ3 ÛĞzÅÀì åäzɳ ɒnɳ ĞĿäÀÎQèä gKDzg̊ .ĞɳÆÁQÊţä

ĞʌÅÀĦæ ĞÀÆŢÀöä ĠəÅÀÔöä ÈŧŸĦ ÛÀÎÀöä gÂEŦDZ ŷäÆÁQèÅæ Û(ЧŸÛöä ÛÕEŸ8Qöä) ÈEGŸQöä gÅĦɳ ɒnɳ slurry Ğæşø ÀŘHuĦ öäzTä Ž ZDzQö ĞÊŧŸţä ĠəÅÀÔöä öÀQĦ .gşåÀzǧä Ž Õöæ Kdɳ БÛ øÅÎĦ B Åɳ ÛļŸɳ 0.25 ĞäÀęɳ ĞɷÅÁɷ ğäæ ĞÕGÛæ gKGõ B äæŮ .åƎQö öÀQĦ Ż ÛĞÕŒęå 30 gÆɳ °ỹ110 gøäÀg̊ ĞDZøÆæ ÛgşåÀzǧä Ž Õöæ Kdɳ БÛ øÅÎĦ B Åɳ ÛÙĦÎAQQö ɒÅÊĦş ĘßŕÙʌÀì ţÂøÆĦ .R ÛZɸDzɳ ÛÅÒEŸŒÊöä ĞɳYŁ ƁzƷ ZɸDzɳ Ž ɹÅÅĦ ÛgÀìÅGɳ òÅŧĦQèŸö ĞŦBZzɳ ĠəÅÀÔöä ɒÒĦ .ĞHuĿÀÔŸö ĸʌåzŧĦöä ĸGɷÅəä ɒnɳ ĞÊŧŸţä gåÅţä ɒnɳ (ļŸɳ 5-2)

ÛřşÀÎöä ℄ØŁ ÒƷɳ ĦzŸGöş .gşåÀzǧä Ž Õöæ Kdɳ БÛ øÅÎĦ B äæŮ ÛĞĦÎĦɳ gKDzg̊ řşÀì ŘƠ øÅGQnŗä öäÀDZÛ ļQʌ àøş ƷÎQʌ ɔøQg̊ öÀHuQţä øzÛöä ɒnɳ ĞĿzÅõ ĞŁŧõ gKDzΣä ÒnäåÆ ÊÔĦş ĠŁìÀQöä àøzæ ĞĿäÀÎQèŗä gKDzΣä ɒÛĞĦ Ž Õęɟä ɔŸ3 Ğ3Åè 1 gÆɳ øäÀÔQèŸö öÀQĦş gKDzΣä ĘŸ8Ħ .ļŸɳ 5 ĞäÀęɳ ĘŧĦæ øzÛöä äØŁ ɒnɳ ĞÕGù 3řzʌş ĠŁìÀQöä .ĞzÀ8öä gøäÀg̊ ĞDZøå

Method hʊsĭþU‴ε

.%60-50 ɒnɳ ĞEGÊɷ Ğæzùø Ž ÕŘÅɳ ÕÒÎæ öäzTä БÛ ĞHuĿÀÔöä ÅŦTz ôÀĦĦ Ʉø Qöä ğÅEŸŧĦöä ÕÕ ÂDzÀĸ ɹÛ ÆƵ ÂDzĦ .ļŸɳ 4 ɒ3 ÅŁÀÛę ÁʌÂʌ ŗ ɹÛ ÒŘÅĦ ÛgÂQŸɳ ĞĦÕæ ÕÒÎæ gşåÀzǧä Ž åÆHuɳ zŁ Åɳ ÆÊШ òzŸ∓ä ļDzg̊ ĘɷÛĦ ĞæäÀę ɔŸ3 ĞĦÕGöä 3řzʞ ɹÛ ÆƵ .ĞGèÀʌɳ ğåÅÛ ВÛ şÛ ĞÆÕHuɳ şÛ micropipette ВşÀÖɳ Òŧŧɳ ÿäÆÁQèÅæ ĘEGÛQöä ÙÛƯ ɒnɳ ÀƷõÛ öÅʌŁ ɹzÒʌ ÅɳÁÆ3ş .ĞHuĿÀÔŸö ĸʌåzŧĦöä ĸGɷÅəä ɒnɳ ļè1.5 ɒnɳ ÀƷõÛ ŗş ÅEɷÆöä ĞzÅΣä ɒnɳ ļè1.5 ÅŘĦæ ÅŦŘĦæ ɒnɳ ļè 1.5 ɒ3 ÕÕʌ ŗ ÆĦ ɔŸ3 ƷÕGöä 3řzʞ şÛ Æƶ ÛÅŦÊÅɷ ĞHuĿÀÔöä ɔŸ3 àÅƠRö Ágäş ƬøääÀÎQèä Ʒɳ ÛāäÀÎQèŗä gKDzg̊ Ž ĞHuĿÀÔöä 3řzʞ ÛŧŸɳÅõ ÆʌØţä ÀÁGQʌ ÅɳÁÆ3 .ĞHuĿÀÔŸö ÅEɷÆöä ĞzÅHuŸö ɹàäzɳ Ùn ɔŸ3ş ĠÛè ƤzQÊɳ ȧzz ğÅÆĦöä ĘEGÛĸ ŕÅÕɷ ɹzÒʞ ɹÛş ÀʌÒư Õöæ ɹÅõ Åŧŧõ Ġʌåzŧ3 ĞHuĿÀÔöä ɹzÒʞ ɹÛ ɒnɳ ÆõQöä Û ļè15 ɔøQg̊ gåÅ3 ÛåzĦÔŸö öÀHuQţä øzÛöä öÀQĦ .ĞQæÅQ gøäÀg̊ ĞDZøÆæ ÅŦEŸ3 ŞzÅHuĦş gKDzΣä ĘŸ8ĸ .öÀHuQţä øzÛöä zŁ Åŧõ ZɸΘş (öÀHuQţä øzÛöä) ÆʌØţä (ĞɳÆÕɳ) ĞŦGDZ Ʒȩzɳ ļĦĦş Û āäÀÎQèŗä gKDzg̊ ɒnɳ ĞHuĿÀÔöä ţÂøÆĸ

Ĭ ɔƥNjllɛ ƒɛƥlɬɛÚɛ

Paper Chromatography

Áę Uøǫöä Ûkŧ₃Ɏɳ ĞǫİÁǫş ǰɛÊǫ ɒɳ ȧóɀöä ɒɳ ĞHʊɛÀò ɀŁ Uęóɀöä ā¡äÀÎǫèɾä Ž stationary ÀÕǫÊŧğä óɀÛöä .õÀHʊŧğä óɀÛöä 3ɳ ĺDZşÂɳ ɹɀÒʌ ɾ ƁØöä ÕəİÊöä óɀÛöİæ ĞæÀÎɳ ĺǫİɛǵÚ ɹɀÒĸ UŁ ĞÕʌÀÛöäş ĞÕɛęÀöä ĞÕĞÛöä ĞəİÀÒò ā¡ÀÎǫèɾä Ž òİΣä ¢ɛŸ3 İư ĸŽǰÒæ ðÙæŭ ǥåİ3 Uęóɀöä UøæäÀÎǫèɾä ÕÓÕİöä ÆĤł ĞʌÒư ŘÊɛö ÛÕöæ ȧɀɀ .ĺÆDZ ǥåşÆŢ ÀÕǫÊŧğä óɀÛöä 8Ɏǫɲä ĞDZóåå ɹj ğɾİŧĤǫèɾä ǥåÆĤǫɳ Ķą ȳİ3 ÕÒÎæ ǥĤǫŧŧğä ǥåİŧğä ɹɀÒĸ İɳÆİ3 3èİş ÕÒÎæ ȳÆÅǫÊĸ UøǫöäŞ Corrosive ĞʌİõÛ ZʼnÎǫ̃ Zˋìɀõ òİŧĤǫèä ÆĺA3 ÿäÆÅǫèɾä ÀŦŦz ĘÕHʊŧş ǥÆɛİÀɳ Uęóɀöä ā¡äÀÎǫèɾä ĞÕʌÀù òÅĸ B ÛÕöæ ļąÀæş .ʒİDZà ĞHʊɛÀò ɔŸ3 ĞÊɒŸɳ ĞʌZÎ3 ɾ ǥåİɳ UŁ .ĞÕɛęÀöä ĞÕĞÛöä ĞHʊɛÀò ɔŸ3 dzİDzİæ ÕÕǫÆöä ɒÒʌ B ℂɾɀǫş ȧóɀöä ÿäÆÅǫèİæ ɒŸòÛ ÀÒǫİä ƁØöäş åäɀŧä ŘɒĞò ÆĒDZ ÕÓǫ ĞæɀŸÛŧä ĞǵİĞöä ʒÛę ÆDZɀǫʌ ÅɳÆĺA3 ÛĞɛöİĤz ĂʒõÛş ÕŦèÛ ĞÕʌÀÛöä ℂØŁ ɸĤǫz ĞŁŧÒöä ZÔɸş ĞŁŧÒöä ğİèÅɛÕŸö ĞĞÊĺöİæş ĞÕĞÛöä āäÀÎǫèä Ž ĞöİĤİöä ğİɳɀÒŧä ZÛì ÕDZj ȧɀHʊÊŧä ĞÕĞÛö ÔɳİÒöä ţÂøİöä ɒɳ Û¢ǫÔİŧä ğİɳɀÒŧä ZŲĩş .ĞÕɛęÀöä

.Uęóɀöä āäÀÎǫèɾä ɔŸ3 ǥİÊǫɳ ÕÒÎæ ĞÕɛęÀöä ĞÕĞÛöä āäÀÎǫèä Ž ɹİÎęİŧğä R_rş R_f ķǫŧɛÕöä İɳzŦİɳ ĘĞÛʌ ĞÕʌÀÛöä şÙ descending Ğöàİöä ĞÕʌÀÛöä ÆÊǵ Uęóɀöä āäÀÎǫèɾä àİŽÕ ɒÒŧŧğ ɒɳ ¢ɸüz ǥĤǫŧŧğä ǥåİŧğä ĞĤɛĞù ÆĞÊæş .ascending ǥÆ3İÔöä

RECOMMENDED PROCEDURE Nhh Ĭ Ţ Ädž!ƒ Cƒƨɳ Ũƒ

Descending paper chromatography üŘ Ĭ ɔƥNjllɛ ƒɛƥlɬɛÚɛ

ðİÛą ğäæş ÛÕŧĤǫÊŧğä UøæäÀÎǫèɾä ȧóɀöä ÆɛõÀǫö Ğŧ₃Ɏɳ åİĤæÙ ğäæ ĞɛDZİDZà ǥKDzǵ ɒɳ àİŦɾä ɹɀÒǫʌ Ž ĘĤł .gåäÁÊæ şÙ ÖɛÕǫ UDZİDZà ÆɛŘÕæ ĘŸ8ł ļè 1.5 ĞæäÅę ℂÀÛę ÆÕǫ ðİÛ8öä Ž ÁDZɀʌ .ÿİÒǵüæ ĘŸ8ʌ UDZİDZà .ĞɛæäÀÎǫèɾä Ğęóɀöä ÕÊɳ ÕDZj ÛʒİDZÂöä ɒɳ ÆɛŘę gåİ3 ÛgÂĘŦDZ Ğùİèɀæ ÆʌØŧğ ô ɀǵ ǥKDzΣä ɒɳ ɾŸ3ɉä ļÊÕöä ŦŦz ǫÁʒ ɾ ĞÕʌÀÛæ Ğęóɀöä ļ3Æö ɹŸɛöå ɹĂǥŘę ÛİĂɛŸĤöä ¢ɀɀǵ àɀɀş Ûʒɳ Bàäɀǫöİæ Û ô ɀΣä ɒɳ ÆɸİDZ Õõ Ž ÁDZɀʌ ÆÊǵ ʒÛÕɳ ÛÆèİÀɳ ÁɛìÀĬ àóş ɒɳ UøæäÀÎǫèɾä àóɀöä ɹɀÒǫʌ .ǥKDzΣä ɹäóÁDZş ŦŦɳ ðÂDZ Bİ ķæ âĂǫ ℂİΘİæ õÀHʊǫğä óɀÛöä ĶÊʌ ǪɛШ Ğęóɀöä ʒÛÕĬ Ü ô ɀΣä òɀùş ļè 2.5 ķæ ļąŸɳ ô À3 Büäş ȸ8İõ òɀÛæ ÙąäÅì .ĞęóɀŸö grain ÆĝHʊğä ÁÛÊöä

Method ĞÕʌÀÛöä

õÀǫĬş ÛgKDzΣä ĘŸ8Ĭ ÛgåşÀɀǵ¡ä Ž ɒĤĤğä ÀÕǫÊŧğä óɀÛöä ɒɳ ļè 3-2 Ęŧĥæ ĞÕĞù ĞɛääÀÎǫèɾä gKDzΣä ţİę Ž ʒřɀʌ

ĞDZǾÆa ŏãչTã Бŭ Ğęǿչõä ÅŁŏÅĄǪŭ ôᾹĦŧ Ʉøǫõä ğÅEŸŧĦõä Ōõ àÅĞŭ ŌŸRÁł .ĞǪæÅǫ gǿäÀg ĞDZǾÆa Ğʒ̊Åè 24 gÆę ǿäÀŌǪèŸŏ ƱŌչŭ ʅʒ̊ǫ Ùn ʅèÀʌ .ĞŌgŸõä ğäŏäÀDZqą̈ gÆę ĞŸŒù îşÀÎõä ₡ØŁ ŘƠ gKDzΣą̈ ɔŸʒ ŞչÅʒ .%50 ĞæäÅę ĞŒĞÊǫ Ğæչùǿ ɹչÒʌ ÆʌǾʊą̈ ôչg Ž ĞʌÅŻʌõä ₡ØŁ Ř€ʒ̈k ÅǫÆÁʒ ŌÒÎa ƙǪÅŻʌõä ?Ágŭ dǫ ĞᾹĦǫ ĞչÅÊǫ ɔŸʒ Ğęǿչõä Ǝʒ î Åòǿ ʅŸŌæ ŘƠ ğäÀǪǫ ƱøǪʌè ʒRa ĞչÅÊǫ ɔŸʒ Ùʅä ăØŁ ɹչÒʌş Ğıғ Æõä ÆŒRę ȧչ, Àg ŌÒÎa ĦÔŸĦǫ ȧǿչõä dǫ ƱęÅĞõä ʅÊŌõä Ğŧ₫Ħǫ ĞĦŌæ ɔŸʒ ?Ànŭ ǥäåŭ Bŭ şŭ ĞÅÕŢ şŭ micropipette ƁşᾹÒǫ Òŧŧǫ ÿäÆÁǪèÅa ĘĞÛʌ .¢ô ʍÅäȧչǫş Ğıғ Æõä ÆŒRę ¢ŌŒĞÛŘ ôÀǪÅtą̈ òչŸƱŧŸõ ƱŸÒõä ʅDzΣą̈ ǰǪᾹł ɹŭ ƷęչǪtą̈ dǫ ɹÅõ ȧæŭ .ǥåşÀzǧą̈ Ž dĦĦtą̈ òչŸ∓ą̈ ʅDzg̊ î Åòǿ ʅŸę ÙJN ÂDzʌ ÅǫÆÁʒ .БÅǪõä ĘŒĞÛǪõä ŌĞę ZDzÆõ ÅŻʌǫ ŌÕ ŌÀǪʌ ÛõäÂDZŭ ÆÊg̊ òչŸ∓ą̈ ĘĦÛŒz ÛʅŸǫ 10 dǫ ƎÕŭ ÀÛę ğäæ ĞŘŌæ ʅŸę Ùn ɔŸʒ ʅè 3 ʊʒ ŌŌʌ ɾ òչÛæ ĞչÅÊǫ ŌÀǪł Ûı¢ÊÅǫ ȧǿչõä ÙʌÀì ɔŸʒ Ágäş ƱøäÀÎǪèą̈ ÙÛƯ dǫ ÄŽÕŭ .ĞŌŒęå 90 gÆę ǿäÀŌǪèŸŏ ŌÀǪķş ÛŏÅÛ8õä ĘŸ8ʌ Ûāä̈ÀÎǪèɾą̈ gKDzg̊ Ônäå Ğęǿչõä àÀ8ł .ĞŌĦÛŧą̈ ŌŒŏÅ∓ą̈ ₡æ î ÅòÀõä ĘŸ8ķ ÛgåşÀzǧą̈ Ž dĦĦtą̈ ŌÀƱƱŧą̈ óչÛõä dǫ ĞŒչÅŌ ĞŒŧŌ ÛŏÅÛ8õä Ž åչDZչŧą̈ ÆŌŽõä Ǝʒ ÛÆʌǾŧą̈ ôչg Ž ÔnÁł gKDzg̊ dǫ Ğęǿչõä ţÂøʌķ .åʌ∓ą̈ dǫÅõä şŭ Ğzzòչŧą̈ ĞչÅÊŧą̈ ɔøǪg̊ āäÀÎǪèɾą̈ ĞĒŸŧʒ óչÛǪǪõ ŌÀǪķş gKDzΣą̈ .ZŒÅDzǪõäş āäÀÎǪèɾą̈ ğÅEŸŧʒ ŏÅʌǪŭ ƷùÅÊõä ŏչRõä dǫ Ğęǿչõä ĞʌÅþ Æz .ŏãչTã Ž ZDzǪõ ŌÀǪķş āäÀÎǪèɾą̈

Ascending paper chromatography ǫŸƑTⅡε Ĭɜþ₦jⅡε ƒεþʅIƨÚε

ŏÅÛą̈ ğäæş ÛŌŧĦǪÊŧą̈ ƱøäÀÎǪèɾą̈ ȧǿչõä ÆŒŌÀǪõ ĞŧəŸǫ åÅĦæŭ ğäæ ĞEDZÅDZà gKDzg̊ dǫ àÅŻƨą̈ ɹչÒǪʌ Ǵǫչ ɹşå ÅŁãչǪÊǫ ŘąÁł ɹŭ dÒչş ĞŒäÀÎǪèɾą̈ Ğęǿչõä ĘǪĦŭ gÂŒŻDZ gKDzΣą̈ ɔŸʒŭ Ž ÆDZչʌ .ȳÅÒgŭæ ĘŸ8ʌ ƱDZÅDZà ɹչÒǪk .ĊãչǪÊǫ Бŭ Ğęǿչõä ŘŒÅơ dÒɛ ƁØõä ŌÀƱǪtą̈ óչÛõä ŏãչǪgɾ ÆĒĦǫ dƱò gKDzΣą̈ ţÅę Ž ÆDZչʌ .gKDzΣą̈ ʒÛŌk Ülè 2.5 ʊʒ ŌŌʌ ɾ ôÀĦæş 8Åõ òչÛæ ÙąäÀì ÆÊg̊ ĞĦÛŌǫ ÛĞŧəŸǫ ǴŒìÀk Ğęǿş dǫ ĞŒæÅÎǪèɾą̈ Ğęǿչõä .Ğęǿչÿõ ÆĦ∓ą̈ ǴÛÊõä ₡ÅƟÅæ ŌÀƱǪtą̈ óչÛõä ĸÊʌ ǪŒŭ Ğęǿչõä

Method ĆŌʌÄÛõä

ÆȮÊʌ ÛgåşÀzǧą̈ Ž åÆĒg̊ Åǫ äæŭş .gåşÀzǧą̈ Ž åÆ∓ą̈ ŌÀƱǪtą̈ óչÛõä dǫ ʅè3-2 ĘŧĦæ ĞŌĞù dƱÔõä Ž Ʒřչʌ Ğʒ̊è 24 gÆę ǿäÀŌǪèŸŏ ŌÀǪķş ĞŒæÅÎǪèɾą̈ gKDzΣą̈ ĘŸ8ķ .dƱÔõäş ĞŒæÅÎǪèɾą̈ gKDzΣą̈ ɹäǿÆDZ ĸæ ÀŌǪÊtą̈ óչÛõä Ōõ àÅĞŭ ŌŘÁł .ĞŌgŸõä ğäŏäÀDZqą̈ gÆę ĞŸŒù gǿäÀΣą̈ dǫ ĞDZǾÆõä ₡Øŏ gKDzΣą̈ ɔŸʒ ŞչÅƱł .ǪæÅǫ gǿäÀg ĞDZǾÆa î Åòǿ ʅŸŌæ ƱŌչŭ ʅʒ̊ǫ Ùn ʅèÀł .%50 ĞæäÅę ĞŒĞÊǫ Ğæչùǿ ĞDZǾÆa ŏãչTã Бŭ Ğęǿչõä ÅŁŏÅĄǪŭ ôᾹĦŧ ɄøǪõä ğÅEŸŧĦõä ɔŸʒ ?Ànŭ ǥäåŭ Bŭ şŭ ĞÅÕƱǫ şŭ ƁşᾹÒǫ Òŧŧǫ ÿäÆÁǪèÅa ĘĞÛʌş .ĸǪÅŻʌõä ?Ágŭ dǫ ʅè 3 ĞչÅÊǫ ɔŸʒ Ğęǿչõä Ǝʒ òչŸƱŧŸõ ƱŸÒõä ʅDzΣą̈ ǰǪᾹł ɹŭ ƷęչǪtą̈ dǫ ɹÅõ ȧæŭ .ǥåşÀzǧą̈ Ž dĦĦtą̈ òչŸ∓ą̈ ʅDzg̊ î Åòǿ ʅŸę ÙJN ĞŧĦæ ĞŘŌæ ĘŒĞÛǪõä ŌĞę ZDzÆõ ÅŻʌǫ ŌÕ ŌÀǪł ÛõäÂDZŭ ÆÊg̊ òչŸ∓ą̈ ĘĦÛŒz ÛʅŸǫ 10 dǫ ƎÕŭ ÀÛę ğäæ ĞŘŌæ ¢ŌŒĞÛŘ ôÀǪÅtą̈ ʅè 3 ʊʒ ŌŌʌ ɾ òչÛæ ĞչÅÊǫ ŌÀǪķ Ûı¢ÊÅǫ ȧǿչõä ÙʌÀì ɔŸʒ Ágäş ƱøäÀÎǪèą̈ ÙÛƯ dǫ ÄŽÕŭ ÂDzʌ ÅǫÆÁʒ .БÅǪõä

[illegible] 90 [illegible]

[illegible]

Column Chromatography

solid [illegible] *:adsorption column chromatography* [illegible] silicic acid [illegible] suupport [illegible] slurry [illegible] (kieselguhr [illegible] adsorbent [illegible] effluent [illegible] (eluate [illegible]

[illegible] *:partition column chromatography* [illegible] .solid adsorbent [illegible] .elution [illegible] siliceous [illegible] earth [illegible] *reverse-phase* [illegible] paraffins [illegible] silanizing [illegible]

[illegible]

[illegible] distribution coefficient [illegible] dissociate [illegible]

[illegible] *Ion-exchange chromatography* [illegible] ion-exchange resin [illegible]

[illegible] counter-ion [illegible] H^+/Na^+ [illegible]:

$$RSO_3H + Na^+ \leftrightarrows RSO_3Na + H^+$$

[illegible] Cl^-/OH^- [illegible]:

$$R'N(CH_3)_3\,OH + Cl^- \leftrightarrows R'N(CH_3)_3Cl + OH^-$$

[illegible] 1 [illegible] 5 [illegible] 2 [illegible] stoichiometric [illegible] (%300 – 200) [illegible]

Treatment of the ion-exchange resin and preparation of the [illegible] column [illegible] 24 [illegible] 80~) [illegible] 1 [illegible] 3 [illegible] effluent [illegible] TS [illegible] alkalinity [illegible] R [illegible] 70 ~) [illegible]

[illegible] .neutral

[illegible]

[illegible]

[illegible]

[illegible] (ó/ȟ 80~) [illegible]

[illegible] (ó/ȟ 70~) [illegible]

[illegible]

[illegible]

High - performance liquid chromatography

Introduction [illegible]

[illegible] (HPLC) [illegible] adsorption [illegible] (HPLC) [illegible] .ions [illegible] size exclusion [illegible] ion exchange [illegible] partition [illegible] HPLC [illegible] stationary phase [illegible] Mobil phase [illegible] solutes [illegible] distribution [illegible]

[illegible] purity [illegible] HPLC [illegible] enantiomeric composition [illegible] .chiral [illegible]

Apparatus [illegible]

[illegible] injector [illegible] pumping [illegible] detector [illegible] fittings [illegible]

pumping system [illegible]

[illegible] to deliver [illegible] HPLC [illegible]

pulse ... "bleeding ... HPLC ...

microprocessor ... (isocratic elution ... (gradient elution ... flow rate ... (6000psi) ... 42000 ...

Injector

fixed-loop ... partial filling ... auto-sampler ...

Chromatographic column

2 ... 5 ... 500 ... 50 ... 10-5 ... (microbore) ... 2 ... 60 ...

stationary phases

nonpolar ... polar ... HPLC ... normal-phase ... revered -phase ... HPLC ...

[illegible] porous graphite [illegible] alumina [illegible] –
[illegible]
[illegible] polymers [illegible] –
[illegible]
[illegible]
[illegible] resin [illegible] –
[illegible]
[illegible] –
[illegible]

[illegible] silanol [illegible] support [illegible] .([illegible] HPLC) [illegible] covalently silyl [illegible] silane [illegible] active sites [illegible] derivatives [illegible] bonded phase
[illegible]:

	Common bonded phases [illegible]	
C_9	$Si-(CH_2)_7-CH_3$	octyl [illegible]
C_{19}	$Si-(CH_2)_{17}-CH_3$	octadecyl [illegible]
C_6H_5	$Si-(CH_2)_3-C_6H_5$	phenyl [illegible]
CN	$Si-(CH_2)_3-CN$	cyanopropyl [illegible]
NH_2	$Si-(CH_2)_3-NH_2$	aminopropyl [illegible]
	$Si-(CH_2)_3-OCH(OH)-CH_2-OH$	diol [illegible]

[illegible] enantiomers [illegible] (chiral [illegible] albumins [illegible]
[illegible] 8.0-2.0 [illegible] styrene vinylbenzene copolymer [illegible]

ǨĿƶǎÀȣȍäă ş᷊ ČȍǾÉĤʈă Ǩą ÅÒĿĽŸÊȍäă ȳǾÉÁǫÊʈă ƁåÅÌĤȍäă óƶÛȍäă Ž HPLC øȍäă ȳäÆÁǫèÅæ ÕĿĽĤʉǫȍäă ÕŧŧĤǫÊł òÂʌ Ɓ Ž ʉøǤÛę ɾ ȍÀHʉǫą óƶù Ȝą ÀÕǫÊą óƶÛõ (òƶʌÆȍäă ş᷊ ÕĿæşÀæƶɸÅĿè ÛᷤŸȞą) ᷤĿəÅĿŧłõ ČȍǾÉĤʈă ÅÒĿĽŸÊȍäă ş᷊ ʉŧĿŧÊȍäă .ğɾÅΣă ŘĤæ

.ÀǫnşÀÒą 10ş 3 ǩæ dzşǎÀǫʌ ᷤȜƶĿì ÄȞõɟǎ gÀÕǫÊʈă óǎzùCǫ᷊ ĻĿÊŸɐă ĻDzǵ ɹǔz ČĿŸĽŸHʉǫȍäă ÕÔÅȍäă ğÅĿŸŧȝ ÕDZᷤ dbą óƶÛȍäă ČȍÅǵ Ž .ČĿȜƶɸ ǴÛè Čǵ᷊Åæş ČÅŸǫƯ porosities ğÅĿnÅÊhą dbą ČŧŢǪʌą Ǩą ş᷊ ČʌşÅõ ğÅŧĿĿÊɔă ɹƶÒǩ Æęş ɹƶÒǩ Æę ÛÕȍæ dbą ÄȞõᷤÛ Ûcarbon-loading ɹƶɐÀÒȍäă ÕĿŧƠ ÆÊШ ÄÕǫÊʈă óƶÛȍäă îÅǤǩøăă ƧÆą ȸȜ ÀĤĦł ÛâƶÒĤȍäă residual silanol ČĿȍÅŧŧȞȍäă òƶɸŸĽÊȍäă ğÅȜƶŧſ åÆȜ ɹƶÒʌ ÛɃᷤ Û"end-capped ČʌÅŢʌȍäă gÅÛ8hą" gÀÕǫÊʈă óǎzùɟă ƧøÓȍäă ÕʌʌØǩ ǫÆȞ ɹᷤ ȸÒƐ .ȸĤĦhą ÄÕǫÊhą óƶÛᷤ ʉøɐɐÀÎǫèɾă õƶŸÊȍÅæ ɃÅĤŧŧȞæ ČØŁ ĻŢÊł .ČȞȞȞʈă ČĿŸŧĤæ ĤŘÅÁĦą .ČĿȍÅŧŧȞȍäă òƶɸŸĽÊȍäă ğÅȜƶŧſ ÆDZǎƶǩ ÅŧʌÆǵ ÛǤʌÆȜÅÕȍäă åǎƶŧŸᷤ î Åǹ ÕÒÎæ Ûtailing of peaks

Mobile phase ǨȬÁḦʉǫʈă óǎzùɟǎ

ČĿəÅĿŧĽÒȍäă ČĿəÅʌÂĿÅȍäă î ǎƶĻă ɔŸȝş ãƶŸÛʈă retention âÅǪǵɾă õƶŸè ɔŸȝ ǨȬÀHʉǫʈă óǎzùɟă óÅĿǪǹă Ætǫ᷊ʌ .analyte ǨĤĿŸĦʉŸᷤ

ȳäÆÁǫèă ÆDzĿƶ ÛǨȞĤʈą Ǩą gÀÕǫÊą óǎzùüæ ÕŧŧĤæ ƁÓȍäă ƁåÅĤȍäă óƶÛȍäă Ž àÀʊǫă ƷĿƶÀȍäă ÕəÅÊȍäă ãäÀÎǫèŸᷤ ǴǤÊʌȍäă óƶÛȍäă gǒÅÅõ ŘęÁÆĿè ǒÅʈă ãØŁ ɹɟ ÕÀHʉǫʈă óƶÛȍäă Ž ǒÅʈă åƶDZş ÆʌΘ Æƶş .lipophilic ĻHʉÎŸᷤ ǴÅĿȍÛ ğÅǤʌÓą ɹşå ş᷊ Ɜą ÛǴĿəÅą ǨȬÀHʉǫą óǎzùᷤ ȳÆÁǫÊł Ûâƶ0Ĥȍäă óƶÛȍäă Ɓǽ àÀʊǫă ƷĿƶÀȍäă ÕəÅÊȍäă ãäÀÎǫèɾă Žş .ÀÕǫÊʈă .ǤʌƶŘȝ modifiers ğɾǽĤą

ÀǫnşÀÒą 0.45 ǨǩǾ dbą ǨȞnąÅÊą ğäæş ÆèÅʌą ʉəÅÎd Ùyʹ ğäǽ ǴìäÀą Ǝȝ õÀHʉǫʈă óƶÛȍäă ǴȞäÀł ɹᷤ Æƶ ȳƶDzΣă âÅę òŸȵ dbą gåÆĤǫʈă ğÅǫƶÒʈă ğäǽ ǨõÀHʉǫʈă óǎzùɟă ǄŘƠ ÆƶşˌĤÒĿǫÅÒą ğÅŧĿĿÊɔă ţÂøʌÅõ ɔøǩúł ɹᷤ dbÒƐ ÛÕʌÆǽ óÅĿÅõş .ʉÒĿǫÅÒą şᷤ ɃşÆʌ ȝÂą Ȟƶȝǫą ÛȞʌåäÅƶᷤ ğÅǫƶÒʉŸᷤ (ÕȞǽ Ǆą åÆĤʊł Ɓ Åą) ǨƶƳÛʈă .ǨƶƶąÀʈă ǴǤÊʌŸᷤ ȞÕƶş ȝÂŧłş ãäÀÎǫèɾă ÕəÅè dbą gåĤȚ ȳÅÊę᷊ ʉÛĤǩ ğÅȞnÅŧò şᷤ ǴʌåÅƶ ğÅÁÂRą ǨÛèäƶɾă ğÅʌÓʈă ǫşÆǵ ÆʌΘ ÕDZɟ ÑRȍä Õǫę sonification ǨĿǩƶÔȍä ȝäƶzną Åæ şᷤ ȳƶĿŸĽTä ÀÅ8ă åÅÛȍÅæ ğÅʌÓʈă dbą gåȝ ÀÅ8ȍä òäÂʊ .8ÅÎÒʈă (gǄDzǵ) ǨĿŸǹ Ž ǴʌÀÅąˌ ğÅȝÅÕƶ

õÀHʉǫʈă óƶÛȍäă ǄŘHʉǫȍ ǨnąÆÁǫÊʈă ğÅʌÓʈă ɹƶÒǩ ɹᷤ ÆDzĿƶ ÛǨĽDzÊÀʌǴȍäă àƶƶ ǨĤƴìɟă 8ÅÎÒĎą ȳÆÁʊèă Åą ăæᷤ Õȍæ ɟÅõ ăæᷤ ÛȍÅŁÅǴȍäă (ȳÅÒǵᷤ) ÕʌÆĤǩ ȍäÅDZᷤ ÆƶşˌƵÎÒȍä ǴDZƶą òƶù ÆÅȝ ǴƶÅÀìş stabilizers ğÅǫȞƶʈă dbą ǨĽȍÅǹ ǨĽȍÅĤȍä ǨĽǴÛÕȞä ğäæ buffers Ùǿäş Æä ÆʌΘ ÆDZƶǫʌ .ɟʌÂʈă ÈĽȍş õÀHʉǫʈă óƶÛŸᷤ ʉəÅʈă ɹƶÒʈă ȳÆÁǫèÅæ ÛʌʌóşÅÀr ɃƶŘĤȍä òʊĤʈǎş ȍÅʈă dbą 8Åõ ɟʌÂą àÀƮɔă ÕÊą ÆDzĿƶ ÛÙǿäşÆȍä ǄnąÆÁʊèă Åą ăæᷤş .ǨõÀHʉǫʈă óǎzùɟă ǄŘƠ Ž .dzŸnɟă óȞƶŸǩ ÆʌDzǫᷤ õÀHʉǫʈă óƶÛŸᷤ organic modifier

counter–ion

chiral selector ion-pair

.achiral

Connecting tubing and fitting

injectors

.detectors

."zero-dead volume (ZDV) type

0.25 capillary

band spreading

Detectors

(UV/vis)

fluorescence spectrophotometers

chromophoric analyte

(UV/vis)

diode array UV/vis

UV/vis absorbance

.eluted peaks

spectral homogeneity

.validation

pre-column

.post-column

Date collection devices

integrators signals

[illegible] computers [illegible]

[illegible] thresholds [illegible] peak [illegible] integrator [illegible] parameters [illegible] baseline separations [illegible] valley-to-valley.

[illegible] (HPLC) [illegible] %0.05 [illegible].

System suitability [illegible]

[illegible] resolution [illegible] porosity [illegible] carbon loading [illegible] end-capping.

Efficiency (N) [illegible]

[illegible] *theoretical plates* (*N*) [illegible]:

$$N = 5.54\frac{t_R^2}{W_h^2}$$

[illegible]

t_R = [illegible] perpendicular [illegible].

W_h = [illegible] t_R.

(N')

$$N' = \frac{N}{l}$$

l =

Capacity factor (mass distribution ratio D_m) (D_m)

$$D_m = \frac{\ldots}{\ldots}$$

$$D_m = \frac{(t_R - t_M)}{t_M}$$

t_R =

t_M =

D_m

D_m 1

Resolution factor

$$R_s = \frac{1.18(t_{R2} - t_{R1})}{(W_{b1} + W_{b2})}$$

t_{R1} t_{R2} =

W_{b1} W_{b2} = peaks widths

[illegible] t_{R2} [illegible] t_{R1} [illegible].

1.5 [illegible] baseline separation [illegible] R_s [illegible]

[illegible].

Relative retention [illegible]

[illegible] (r) [illegible]:

$$r = \frac{t_{R2} - t_M}{t_{R1} - t_M}$$

[illegible]

t_{R2} = [illegible] peak of interest

t_{R1} = [illegible] reference peak

t_M = [illegible] unretained component

symmetry factor [illegible]

[illegible]:

$$A_s = \frac{W_x}{2d}$$

[illegible]

W_x = [illegible] 5% [illegible].

d = [illegible] leading edge [illegible] 5% [illegible]

[illegible] W_x.

[illegible] As [illegible] 2 [illegible] silanol [illegible] talling [illegible].

Repeatability [illegible]

[illegible] assay [illegible] relative standard deviation [illegible] 2.0%.

ğÅ3ÀÀǩóã ş Ɂ́óØõã ğÅǵÅĞõ ȕøǤÊÆõã ÐóÀŁĦţã ȣãÀUɾã ȷŭz Û"Related substances ĞõÅÎţã åãzţã" óÅĞQǹã Ž ÅnĻ
.ĞΛåÀÀÀõã gşåÀzǵã Ž Õ̃õǽ ȣƳǹ dbĦ B Ån Û%5.0 ȸ3 ÆΛÂΛ ɾŮ Æz gøÀÒn dbÕğ ǫƳ̃ö Ɂ́óØõã
.%1.0 ȸ3 ĞŁÊŁəÀõã gşøØõã âÅĞQǵã dbnÂö ȕøǤÊÆõã ÐóÀŁĦţã ȣãÀUɾã ÆΛÂΛ ɾŮ Æz dbÕΣã dbn ĞƳÊƳè Žş

Recommended procedure Nh Ǐ Ţ Ăđž!ƒ Cƒƨnύƒ

ÆÆ3 ĦQæÅǫ gÆ3ÀÕõã Ùǹ ǴǤÔΛ ɔøǫǵ ȕøããÀÎǫèɾã ÿÀĮÆõã Ǝ3 ā ÅÊΛ ÕÀHǫţã ózÛõã ÕÀQΛ ÛÅzɻĦõã Ģpàãzɳ ĞŁ8æ Åɻtõ ȕĦDZÀţã òzƳ÷ãş ȣɀòzţã óÅĞQǹɾã òzƳŢ ÀŘĦuł .(ČÕŁęå 30 ĞæãÀę) ĞΛåÀÀõã gşåÀzǵã Ž gåÆ÷ã ā ÅŁÊǫɾã Ǥ3ÀèǀDzǵ ž́ÀǫǫQ ÕĐzÊţã ĞæÅDzQèã ş/ş ȣÅÎÒţã ÙŭĦuł ÛĦΛóşÀř ãæŭş Ûȣɀòzţã ȕĦDZÀţã òzƳ÷ã dbÕHuł .åÆHuɳ ɀŁ dbn Ǒęɉã ɔƳ3 %50 ǴǤÊÆæ ğȲɳÅÒţãş ğÅÛÛÁţã ğȲĐzÊɳ ĘŸĦQΛ ÅɻtŁz ǀDzΣã ãÓŁ ɹɀÒΛ ɹŮ Æzş .ąȣÅõ gşǿæ .ȕĦDZÀţã òzƳ÷ã dbn ĞΘÅΛõã ĞŁæãÀÎǫèɾã ğÅÛÛÁţã Ž ĞŁÊŁəÀõã gşǿØŸö full-scale deflection ǀŭÊõã Ǒnǀõ ȣÅÛĦǫã .system suitability ÿÀĮÆõã ĞnǒȲɻł ĘŸĦQΛ ÅɻtŁz ΚΛÀĦţã 3ɳ ĞÕæÅÛţã dbn ÆĐŭǫõã ǀQΛş
Ǒõ ÛĦȲʒɳ) ğÅÊŁÀĐǫţã ĞŸÊƳè ĞΛÅǴ ÆÆ3ş ÛĞɻĮǪΛɳ ĞŁΛąà Ǒòãzɀ ÆÊШ ÛǒÆǴõã ÆÆ3 ȕĦDZÀţã òzƳ÷ã dbÕHuł ɹŮ Æz
.ÅɻtŢΛɳ ǑÓǒ Ƶ3ÅRɳ ɀU ɔƳ3 ȕĦDZÀţã òzƳ÷ãş ǿÅǪǹɾã òzƳŢ dbÕHuł ɹŮ Æz .(ğÅŁ3 4-2
Ûnormalization (ÈŁŁÕǪõã) õãzèqã ɔ3ÆΛ õãÀDZŮ ÿãÆÁǪèã dbÒɻţã dbɻz ÆÔĦɳ ǰΛÂɳ ğÅɷzÒɳ ÆŁõÃǩ ķŁĦǩ ÆÆ3
Ǒnǵz3 ǨɷÅõ ãæŭ Ɂ́óØõã ǑÒǒ ĞŸÒõã ĞǵÅǴõã dbn ǴΛzÅɳ ĞǴÊɷ ÔÒì ɔƳ3 ǴΛåÀÀõã Ɂ́óØõã ğÅǵÅæ ãÅÊǵ ɔƳ3 ȳɀÒΛ ƁØõã
ɹɀÒǒ ŁÀŢɷ ÛȕøǤÊɷ ÔnÅ3 ɀŁ response factor ĞæÅDzQèɾã ÔnÅ3 ɹŭş .ĞŸǪÅɻtǪɳ ĞΛåÀÀõã ğÅɷzÒɻtŸö ĞŁǤÊÀõã ĞæÅDzQèɾã
ɔƳ3 .óÅĞQǹɾã Ž Ğzɀòzţã îşÅÎŸö ŁÕzş Ɂ́Ànǵã ÕŸǪõ ĞŁǤÊɷ ĞæÅDzQèã ŬŁ gÆǵãş gåÅn dbn ĞΛşÅÊţã ĞŸǪÒõã ĞæÅDzQèã
(UV/vis) ĞŁDzÊÀΛGõã àzɀş ĞŁəÀţã ĞĦÌɹã òÅf Ž ZÎÒŸõ ÂŢÕã HPLC øõã óÅĞQǹã ȳÆÁǪÊΛ ÅnÆÆ3 ÛòÅǰţã ÕŁǤè
ķǪæÅDzQèã ÅŢGəzÌş gåÅɻŸö ɹzÒΛ zU ɔƳ3 detection ZÎÒõã ĞDZzɳ òzù ɹzÒΛ ɹŮ ÆDzŁz ÛÆəzÎõã ĞǴæÀn ÕDZɉ
ɹŭz ÛóÅĞQǹɾã ÆŁę gåÅţã ĞæÅDzQèã ȸ3 (%20± dbn ÄǰõŮ) ǨGõ ÕÒÎã ĞAŸǪƯ ĞæÅDzQèã ĞǴəÅÎŸö ɹÅõ ãæŭ .ķǪŸǪÅɻtǪɳ
ȸbĦĦǩ ÛĞŁĦDZÀn gåÅn ĞNŮ ÀzəzǪǩ B ãæŭ .ÅŢŁÊÅɷ ĞǴəÅÎŸö ĞŁĦDZÀn gåÅn ÿãÆÁǪèã ŬŁ ĞǴəÅÎõã ¢ØŁ ÆΛÆHuǪõ ÕŘzɉã ĞÕΛÀÛõã
ĘŁĦÛɴ ÛƁÅǪÕÅãş .ĞÕΛÀÛõã ÀΛŢÛǩ ĞŸɻȝ õÅΛǪŮ óÅĞQǹɾã ÆŁę gåÅɻŸö ȕøǪõã ÕŸǪõ ǴǤÊɷ ĞŸɻǪ÷ã ÆəzÎŸö ĞæÅDzQèɾã Ônǵz3
ȣƳòzɳ ɀŁ Åɻtõ ÛĦΛóşÀř Õõǽ ɹÅõ ãæŭ Û(ĞæÅDzQèɾã Ônǵz3 reciprocals ğɾåÅĞQɳ ÛƁŮ) ĞΘÅΛõã ĠŁHuÔǪõã Ônǵz3
.ĞΛåÀÀõã gşåÀzǵã Ž
øåÅę î Ån ÑŘ ÿÀĮΛæ gÂŢDzɳ gååŮ ÿãÆÁǪèã Õõǽ ÆŸÛǪŁz Ûgåşàzǵã Ž ßåÆHuɳ ȝşøÉŁɻŸö ÀΛÅÊţã ZÛÎõã ɹÅõ ãæŭ
ĞǪæÅǫ gÆɳ òƳn ȕəÆĞõã ¢ĞŁÕÀǩ ȸ3 õÀHuǪţã øzÛõã ÆŁÕÀǩ òÆĞQΛ .ÀßßǪţã ÆŁÕÀǪõã Bǽ õÀHuǪţã øzÛŸö ÀɻtǪÊɳ ǒÅǪΛŮ ɔƳ3
àÅ⊃Ů dbn Áæɾ ȕÛǀå ÀΛÅÊţã ZÛÎõã ÆÆ3 õÀHuǪţã øzÛõã ÆŁÕÀǩ K8QΛ ÅnÆÆ3ş .gåşàzǵã Ž åÆŢ ɀŁ Åɻtõ ÛdbnÂõã dbn
ãæŭ ĞǪæÅzɻŸö ĦÆzÅõ ĦÅnàà õÀǪł .óÅĞQǹɾã ÕŁõÅŢ KŘHuǪõ åÆHuţã ÆΛØţã dbÕШ ĞŸǹÆǪɳ Ɂ́óæ ĞΛŮ ĞΛzŁ ķŁĦǪõ blank ÆŁÅì

.Бȁǫöä ɑbÕΣä ŌDZŮ ɑbɳ ʊəÆɫɑöä ¢GɫõȂǩ Бŭ õȂHuǫʈä øzÛöä ÆɫʒЙ ȁɳ

ăʀʃƩ‖ε ƒɛþ٦ɬƨÚɛ

Gas Chromatography

øzÛöä ¢ɫz ɹzȮʌ ƁØÓöä åzʇɫĦöä ɔŸʒ ā ȃÀÎǫèʀä ȯȁȮìŮ ɑbɳ ŌȮì ¢ɋŮ ɔŸʒ ƁàȁɨSöä ā ȃÀÎǫèä Бŭ ÀȚÁöä ɑbÓɛ ɑbɳ adsorbent gÂŰʇɫɧ gåȁɳ ȂÕǫÊʇä øzÛöä ɹzȮʌ Áęş .ŌəȁÊöä ÆʌØʇä ɑbɳ ʜʀÆä (ŌɳȁΣä àȁɨSöȁä ϑȂĦʌ) ȁȂȁd ȍȂHuǫʈä gas - solid ÆŸÔöä – ƁàȁɨSöä ā ȃÀÎǫèʀä) carbon ɹzȂÀÒöä şŭ silica gel ȦȮŸŸɫÊöä ĞɳŸŁ şŭ alumina ȦÆɳzŭjȃä ȷʒȁɋ ŌȮÎȃ ĞʇÊÕɳ ĞŸɳȁǹ ĞGŸò Ğɳȁʒå ɔŸʒ Ęɫęǿ ȷŸz ŌȮÎȃ (ȷÆŸÛɳ) ȷÊĦŸɧ ȷŸəȁè ɹzȮʌ Áę şŭ (chromatography ĞʇəŸɳ gåȁɳ Ğʌŭ şŭ ʒȦDZà ğȦGEGǵ şŭ firebrick ƁǿȂÀΣä ÀDZɆǿä şŭ diatomaceous earth ğȃózÛÎȷʇä āȃÀǩ ŌŽɳ K8ò ȂÛę ȃǽ ʊøȃȃÀÎǫèʀä åzʇɫĦöä ɹȃõ ȃǽŭ Ü(gas-liquid chromatography ʊŸəȁÊöä – ƁàȁɨSöä āȃÀÎǫèʀä) ƤȂǹŭ åzʇɫĦöä şŭ "open-tube dzzǫÀʇä āzǫɋjȃ" ¢ɫŸʒ ĘŸÛʌ ȁɳ CÆÊÕǫö ĞɫŸǹȃÆöä ¢qǿØÆDZ ɔŸʒ ȂÕǫÊʇä øzÛöä ÈEGŸǩ ɑbȮʇɫz ȷÆDZ gÆʌÆʒ ĞʇɫɫÊöä ğȦGEGΣä ÛȷŸŽɳ ÛŌəȁÊöä øzÛöȁä (ȷÆŸù) ȷÊɫEGŸǩ ÆŸÛǫk ʀ gÀzȁzǫʇä åȃzʇä ȒȞä Ğǫ .(capillary ƁàĦÎöä .ĞɫʒzȦöä ğȦÕɫEGÛǫöä ȒȞGö gKGõ Ğʇɫęȃæ ℄ØŁ ɸÉĦǩş Ûpolyaromatic porous beads Ğɫǩȁɳşǿjȃä ÆŸÔöä şŭ ŌəȁÊöä øzÛöäş ȂȁɨSöä ƙä ʇȂzǫŸö ʒȒơş åzʇɫĦöä âŭǿ Ž ŌɳȁΣä ȂȁɨSöä óȦɫǩ Бŭ ĞʌȂȁd ĞöȦШ gåȦʇä ŌǹÆǩ ¢qŭ ɔŸʒ (*K*) ȷèȦÕǫöä ŌɳȁĦɧ ϑȁĦʌ .ƤȂǹjä ĞɫȃȃÀÎǫèʀä ɔȦȮìQǫ ʊøǫǿȦõ ĞöȦʌÎɳ ĞÕʌȂÛȃ

$$K = \frac{\text{ÀÕǫÊʇä øzÛöä Ž ĞGəȃ℄öä Ğɫʇõ}}{\text{õȂHuǫʈä øzÛöä Ž ĞGəȃ℄öä Ğɫʇõ}}$$

.ŌɳȁΣä ȂȁɨSöä ā ȦɫÊǫä ĞʒȂèş gǿȃÀΣä ĞDZǿåş ȂÕǫÊʇä øzÛöä ǿȃÆÕɳş ĞĦɫGùş solute ĞGəȃ℄öä ĞĦɫGù ɔŸʒ ÆʇǫĦɫèş ɑbɳ ¢qŭ ǿȦGǫȷȁä Ûş ĞɳÆÁǫÊʇä ĞÕɫęÆöä ÕɫɨÎǫöä ȓşȂìş ʊȷzȦöä åzʇɫĦöä ɔŸʒ ÆʇǫĦǩ *K* Ğʇɫęȷŭ ȷÓəÆÆȷ ȦʊȒȞȃş ɹzȮɫè ĞȷzȒȞzʇä ÕɫɨÎǫöä ȓşȂì ĞƨȁĦɳ ƁǿşȂȒöä ɑbɳ ÛȂnŭ Бŭ gȃåǫ℄ȷȃÔɧ ɑbɳş Ànɇ ƎǫƯ ɑbɳ Ȧɳȁǫɋ ȷÀǫǫqä gåȦʒŭ ÆĦÔöä .ƤȂǹjä ʊøȃȃÀÎǫèʀä Kd ǿȦGǫnʀä ğȃöȃÀDZŭ ȷɳ ĘȃȃÛǫk ʀ ȦŒj ĞǫşȂʇä ɑbɳ ĞDZǿÆȃ ĞɫǫʀÆɫò ğȦʌȦ8ö ğȦÕɫEGÛǫöä ŌDZj ȦɳȃÆÁǫèä Ȃȷõjȃ) ʊŸəȁÊöä – ƁàȁɨSöä āȃÀÎǫèʀä àȁƱq ɸɫĦʇä àȦȚDzŸö ĞɫèȦèjȃ ğȦʇɫÊöä ŌȮÎȃ ƤzǫHʜ ɹzȮʌ Ȧɳ gåȦʒ) ŌɳȁΣä àȁɨSöä ǿÆÔɳ ʊŁ (ÆŸò ȷÊDZ ɔŸʒ ƁàȃÂǫɳʀä āȃÀÎǫèʀä ɑbɳ ĞɫǫʀÆɫÔöä Бŭ ¢ɫÁÊǩ ɑbÓɛ ɑbÕğ ØÅȦʜɳ ÛàȁɨSöä ℂƎʒ ȂɛȷȦȂȁöä âȦɫÕɳ Û(Ù8ȒŸö ȒȷʊƯ ÿȦʇÔȃ gȦȚDzʜɳ ĞǫƙzÛèä Ž ȓz8Ȓɳ ŌȒÅł ÛÕɳȁΣä àȁɨSöä ƤȂf Бŭ ǿȦGǫnʀä òzŸȚ ŌnÆł ¢ƀŸn ɑbɳ ƁØÓäş gåȦʇä ÕŌǩ ʀ ɑbÖö ȂØÁĞk ʊøǫÕöä gǿȃÀΣä ĞDZǿåå ŌÔǺǩ ÛĞɫȃÀÎǫèʀä ĞŸɫʇĦöä gÆɳ ĞŸɫù ŌɳȁΣä àȁɨSŸö ǨȃȦǫ āȦɫÊǫä ɔŸʒ ØəÆȃ ŞȦȂHuł .åzʇɫĦöä gzÎg Ōnȃåå Бŭ gȂìȦGɳ .òȦʇɫĦǫèʀä ÆɫęĞöȦ℄ä ȓşȂÎöä ǨƠ ȦȚȂɳ ŌŌö *K* ĞʇɫÕö ȷÕzş ǿȦGǫnʀä òzŸȚ ğȦqzŌɧ ɔŸʒ ÆʇǫĦʌ Ȧɳ gåȦʒ ƁØÓöä ÛʊŌʌȂǩ Ùy ɑbɳ detector ϑȦÎŌɧ Ž ŌnÆǩ ȦŒüz åzʇɫĦöä ɑbɳ ĘŽĞǩ ğȦqzŌʇä ɹŭ ǿȦGǫȃȦ

detectors Ƶ ĩ ÅÒ ĵ î Åy Ů ɒ ɳ Ǽ Ʌ Ǽ Ĥ ö Ǽ Ɗ ƶ Ʌ .conductivity Ğ Ħ Ÿ ò ƶ ţ ğ ɾ ɲ Ǽ Ğ Ǩ ɔ Ÿ 3 ş Ů flame Ǽ Ţ Ÿ ö Ž ɒ Đ ĩ Q ö ğ ɾ ɲ Ǽ Ğ Ǩ Ğ ò Å ì ɳ Ğ ŧ Ł ę ă ǽ ɲ Ǽ Ĥ ł Ƀ Ø ö ğ Å ɳ ş À Q Ò ò q ă î Å Ô Q ö ă 8 Å Î Ò ô ɳ Û ò Å Ÿ ţ ă Ō Ł G è ɔ Ÿ 3 Û Ğ Ł 3 ƶ Å ö ă Ğ Ł ɒ ɾ Ǽ Ł Ô ö ă ğ Å Ō Ł G Û Q ö ă Ǽ Ł Å ɳ Å Ţ Ř Ĥ ă ş 3 ɳ Ù Ğ Ǩ Å ɳ ţ Á Ř ɳ Б Ů 8 Å Î Ò ô ĵ ă ɒ ɳ Ğ Ł ă Ā Ĥ Ÿ Ô ö ă ğ ă ó Å ì ì q ă À Q] .hologenated ¢ Ā Dz Ĥ Ţ ŧ ă ğ Å G õ Ā ŧ Ÿ ö â Å Ł Σ ă Ƶ Î Ò ö ă Ž Ɠ ƶ ę Ɔ À ɲ Ù Ğ Õ Ʌ À ù Ğ q .ɒ ɳ Â ö ă Ō ɑ Å Õ ɳ ţ Ê Ǩ Ā Ł ɟ Ů ğ ă ó Å ì ì R ỏ ɒ Ò ɛ Ǫ Ł g Ů Ğ Ł Û Ʌ À ì Ğ g ƶ ỏ ɔ Ÿ 3 Ō Ð z Ê ţ ă Ō Ƶ ɳ Ů Ğ G è Å ɳ ş g Â Ł Ƭ D Z Ğ è Å Ê g Ğ Õ Ʌ À Û ö ă ∅ Ø Ł ş .Ƀ à Å ö ă ā ă À Î Ǫ è ɾ ă 3 ɳ ɟ À Q Õ ţ ă mass Ğ Ÿ Q Ò ö ă Ƶ Ł ù â Å Ł Õ ɳ ÿ ă Ǽ Á Ǫ è ă Ʉ Ł Ƶ Î Ò Ÿ ö Ł Ǽ D Z Ğ À Ÿ Ò ɑ ɳ .å ƶ ŧ Ĥ ö ă ɒ 3 ş ø å Å Ô ö ă å ă ƶ ŧ Ÿ ö ¢ Ł ƶ õ ƶ Ò Î ɳ Ƙ ɖ 8 ă À Ĥ Ǫ è ă ɔ Ÿ 3 ò ƶ Ô Σ ă ɒ ɳ ɒ Ǫ Q ğ Å ɳ ƶ Ÿ Ĥ ɳ ÿ Ǽ Ō ƙ ş Ł Ǽ D Z ğ Ɏ 3 Ā Q ö ɔ Ř ơ à Å Ƶ Ɏ λ å ş Â ɳ ɟ À ƶ Ž ğ ă ƶ Q Hu ɳ ɟ ƶ Ò ƙ ş (Ğ Ĥ Ā k À ţ ă ş ø ă À Σ ă ğ Å D Z ø å Ǽ 3 ɟ Ǽ Ĥ ţ Å ă ş Â Å Hu ɳ õ ø Ǽ k Ł Ò Hu Q ö ă ɒ Ò ɛ . î Å ɺ ă Ę Ł G Û Q Ÿ ö Ñ Õ ƶ ş °ÿ 300 Ğ ă ă À ę ɔ ø Q ģ ş Ğ Ł Û Ł ÷ ă ş ø ă À Σ ă Ğ D Z ø å ƙ ă dz ş ă À Q Ʌ ş ø ă À g ò Å f ɔ Ÿ 3 Ğ Ţ ƶ Å ÷ ă Ğ D z ɳ Ǝ ţ ă ş ø ă À Σ ă " Ō ƶ ɳ Ü ɒ ɳ Â ö ă ɒ ɳ Ğ Ñ Ĥ ɳ ş Ǽ ɳ ş ø ă À Hu Ÿ ö Ƙ ă À Q ţ À Å ƙ ø ă ɔ Ÿ 3 Ğ Ţ ƶ Å ÷ ă ɒ Ò ɛ Ǫ Ł Ñ Ñ Ʌ Ù ɟ ă À ƶ ɟ ă ş ø ă À Ш ğ ă Â ŧ ŧ ɳ Ğ ò ƶ Hu Å ţ ă ş Ǽ Õ Ĥ ţ ă ğ Å G õ Ā ţ ă Ğ D Z Â ɳ ɟ ɟ Ò Ʌ Å ɳ Ǽ Å 3 Ğ ŧ Ł ę ğ ă ǽ Ĥ Ƙ Ʉ ø Q ö ă " temperature programming Ñ Ğ Ʌ À Õ Ƙ ÿ 3 ɔ ø Q ģ ÿ 0.5 ò ƶ Û ă Ƙ 8 Ô ö ă ɒ ɳ ţ ƶ Q ỏ Û ğ Å 3 ò ƶ Û ö ă Ğ Å Ÿ Q Ư ş Ǽ ŧ 3 Ů ÿ Ǽ Á Q Ê Ƙ .3 è ă ş Õ Ò Î ă Ğ Å Ÿ Q Ư Ğ Ʌ Å Å Û Ƙ ğ Å Õ Ł G Û Q ö ă ɒ ɳ Ǽ Ʌ Ǽ Ĥ ö ă Ž Ñ ɳ ƶ ŧ 3 ÿ Ǽ Á Q Ê Ʌ Ü Ğ Ʌ À Ĥ Î ö ă ş Ǽ ŧ 3 Q ỏ Ğ G Ê Ʌ ö Å ă ÿ 100 Б Ů 10 ɒ ɳ ş ş ƶ Î Hu ţ ă ş Ǽ ŧ 3 Q ỏ Ğ G Ê Ʌ ö Å ă .ļ Ÿ ɳ 5 Б Ů 2 ƙ ă Ʉ Ÿ ñ ă Ǽ ö ă ℂ À Û ę ɟ ƶ Ò Ʌ Ǽ ę ş ÿ 1.5 Ğ ă ă À ę ò ƶ Û ă å ƶ ŧ 3 Ğ Ł ɋ ɾ Ǽ Ł Ô ö ă .ğ Å ɋ ƶ Ò ţ ă Õ Ô ƶ Ğ Ł ö Å Ĥ ƶ ş ş å ƶ D Z ɔ Ÿ 3 Ʉ Ÿ ə Å Ê ö ă Ƀ à Å 8 ö ă ā ă À Î Ǫ è ɾ ă ş Ǽ ŧ 3 Ů ɒ ŧ ř ş ƶ Q ÷ ă ƶ Î Σ ă ş å Å ţ Ƙ Ğ õ Ƙ Q ü Ƙ Ğ ɋ 60-) À Q ɳ ş À Ò ɳ 250 Б Ů À Q ɳ ş À Ò ɳ 75 Ğ ă ă À ę ɒ ɳ Ł Ê ɾ ă Ł D z ģ Ž ţ ƶ Å Q Ƙ Ǽ ę Ʉ ø Q ö ă Û Ğ G Ÿ Ô ö ă Ğ ɳ Å 3 Ǽ ö ă ɟ Ò Ƙ ɟ Ů Ǽ ƶ ş Ğ ò Å ì ɳ Û ɟ Å Ò ɳ q ă ó Ǽ Õ ă Ğ Ÿ ɳ Å ì ɳ Û (ɟ Å õ å ƶ ŧ 3 Ƀ Ů Ž Ę ƀ ř ò Å f ɒ ŧ ř Ğ ę Ǽ ă å Ǽ Ĥ Ł ɟ Ů ô À Q Å ţ ă ɒ ɳ ¢ q Ů Ł q ó Ü Ǽ Õ Q 200 ɒ Ò ɛ .(Ğ Ř Å Á Å ɳ Ğ Ł G Û ę Ƀ ă Õ ă Å è ɒ ɳ Ğ Ř Å Á Å ɳ Â Ł õ ă À Q ă Ğ Ê Ñ Ĥ ş ğ Å ɳ Å 3 å ɔ Ÿ 3 Ğ Ł G Û ę Ğ Ʌ ş å Ů ā ă À Î Ǫ è ă Ɔ À D z Ł Å ɳ Ǽ Å 3 Å Ƭ Ò Ò Å Ƙ Ž ɔ ø Q ģ ş Ů Ğ Ǩ ə ă Ø ö ă peak tailing g ş ø ă ă Ž Ñ Ÿ Ł Ʌ Ø Ƙ ǰ Q Ĥ Ł ɟ Ů Ğ G Ÿ Ô ö ă Ğ ɳ Å 3 Ǽ ö ă ɔ Ÿ 3 (Ğ Û Ł Î Ʌ ö ă) Ğ ö Å Ĥ Å ö ă ğ ă Ñ Õ ŧ Ÿ ö .À Õ Q Ê ţ ă ó ƶ Û ö Å ă È Ğ Ÿ Ĥ ɟ Ů Õ Ę ę silanizing ɟ Ÿ Ł Ê ö ă Ƶ ì Å õ 3 ɳ Ğ ɔ Å Ĥ ţ Å ă Ğ ɳ Å 3 Ǽ ö ă Ğ Ł Ÿ 3 Å Å Ƙ K 8 Ô Ƙ ɒ Ò ɛ . Å Ƭ G Ƙ Å Ƙ g Å Å 3 Ů ş Ů .ò Å Ĥ ƶ Ƙ ɖ å ƶ ŧ Ĥ ö ă inlet Õ ñ Ǽ ɳ ð Â D Z Õ Ĥ Θ ɟ Ů ɒ Õ Σ ă ğ ɾ Å ŧ Ÿ ö ɒ Ò ɛ ğ ă À Q è Ů ş (ƙ Ÿ Ł Ÿ À q ă ğ Ǽ Ʌ Ǽ 3 ğ ɾ ƶ Ò Ł Ÿ q) macrogols ğ ɾ ƶ ɖ ş À õ Å ţ ă ğ Å Å 3 Ğ Ÿ ŧ Ĥ Q Ê ţ ă Ğ Ÿ Å Ê ö ă ó ă ƶ ù ɟ ă ɒ ŧ Ř Q Ł Ĥ Ł . ğ Å Ł Q ƶ Å Õ ş ó Ǽ Ł ş Õ Å ƶ è ş ɟ Ò Ł Ÿ Ł Ê ö ă ĥ ƶ ŧ ò ş Ł Å Â Å ƶ ă ɟ à ƶ ö ă Ğ Ĥ Å ƙ À ɳ ğ ă Ł ɳ Ů ş .g À Õ Q Ê ţ ă ó ă ƶ ù Q ỏ Ğ ò Å ì Ğ ŧ Ł ę ğ ă ă Ğ Ÿ Ê Ÿ è ɟ Ò Ł Ÿ Ł Ê ö ă ĥ ƶ ŧ Ô ă Ƙ ỏ Ǽ Ł è ă Ł ø Q ö ă polysiloxanes ğ Å Q Å Ê õ ƶ Ÿ Ł Ê ỏ ƶ G ö ă Ɏ Â Ł " ɟ ɟ Å ð Ǽ Ł Q ö ă ş Ō ŧ Ĥ Q Ê Ł ɟ Ů ô À Q À ţ ă À Õ Q Ê ţ ă ó ƶ Û ö ă Å Ƭ Ÿ D Z ɟ ł ŧ Đ Ł ø Q ö ă ɔ Ÿ 3 ɟ ă g ó ă À Σ ă Ğ D Z ø å Ō Ł D z Ê Ƙ Ǽ ƶ å ƶ ŧ 3 Ƀ Ů ò Å ŧ Ĥ Q è ă Ō G ę ş .Ğ ù À Å Ł ɳ g ó ă À ğ Ƙ ɳ Ǽ Á Å ł è ă Å ɳ ă æ Ů ǰ ə Å Q Å ö ă Ǽ Ê Å ŧ ş Q Ǽ Ʒ Ǽ ę " Column bledding å ƶ ŧ Ĥ ö ă ɒ 3 Å ɳ Ñ 3 ƶ ɸ ɔ Ÿ 3 Ů g ó ă À ğ Ğ D Z ø Ǽ ă ℂ Ǝ 3 À ɛ Ƀ Ø ö ă Ō ɳ Å Σ ă à Å 8 ö ă ɒ ɳ ó Å Ƙ 3 ɳ ğ Å 3 è g Ǽ 3 g Ǽ ɳ ¢ Ĥ ř ƶ ă ¢ Å Ł Ò Ƙ Æ z Ǽ Ʌ Ǽ D Z

.Åŏ dzɀÔĄţå ɾŸ3jjå gǿäÀΣå ĎDZǿǻ ȧzɀ ÈĿõ ÆŁõüǪǿÅæ ȸÒǿş ЖÕǵɾ ÅŦŦz ȳÆÁǪÊŁ ɹÙ ô ÀǪǺŁ ЏøǪǿä ĎDZǿÆǿä ĞÕΛÀÛǿä) ЏøɢŦŸǿä ȸȸÑǪǿä Ƶ ÎÒǿ ЖŦDZzȟƾş Жŋƾǹn ɹɀÒΛ ВǾǿä ÅŁÆǵǰ ǿÅĿǪǹå ВøşÀÊǿä ȸŧz ÕŋƾΣå àǺ8Ÿǿ ĞɢÊѦǿÅæ ЖÎÊΛŮ ǰƾŸŋ ɀŁ ȳɀĿŸŤå ɹŮ ǰǰǿ .ЖÆDZ ЖɾɀĞÕŋ ĸDZşÀǪĄǿä ѥĿĦƾş Û(ĞĿǫɾÆĿÔǿä ÕĿõÅHЏǪǿä Ž ЖŋƾÆÁǪèå ÀŠõǰå ĞĦƾÅÎǿä ÅŧŸŠŋ ÛBÅĦǿä ǒÅUŮ ÒõŽ Àzƾzǫŋ Ķdş ЖΛÁÅŋ ƵŸÒĦ ¢ǫŮ ɾŮ ÛĞĿõÅĦǿä ĞΛǿÅÀΣå ĞĿŸõŧzƾå 8ÅÎÛÒĦ ƺŋ ÒŧĦŸõ ЖĿŸĦz ÕŘÁŧş .ĸDZşÀǪĄŸõ ĞɢÊѦõÅæ ȯÅΣå ɀŁ

Ž ЏŸƾÅÊǿä – ВàÅ8ǿä ãåÀÎǫèɾå Ž ĞĿŧÒǿä ğÅÕĿĞÛǪŸõ ĞɢÊѦõÅæ ǥÅÅ3 internal standard ЏŸǹåǻ ВǿÅĿĦŋ ȳÆÁǪÊŁ ƷŘƵ Æę ǻɀŧĦǿä ɾŸ3 ĞĿǫÅǫ ĞѦÕğ ďŋ ǰǰÅǫ ÀǹŮ ÙÛƯ Ʒŋ ĞĿäÀÎǫèɾå ğÅÛÛÁƾå Ægj ĞǫǿÅÕƾå ɹj ĞΛşǻjå ĸÅèå ĞɢÊǫ ĞǫǿÅÕŋ ȯÒɀ ¢ǫj ūÛ]å ãØŁ Ʊ8ŸΛ ВǿÅĿĦƾå òzŸ∓å Бŭş ǿÅǪǹɾå òzŸŢ Бŭ ЏŸǹåǻ ВǿÅĿĦŋ ĞzÅŕŮ ɹŭş .ūÛÁŸõ ЏŸǹåÆǿä ВǿÅĿĦƾå Бŭ ǻzĦǩ ЏøǪǿä gşǿÓǿä ÕŸǩ Бŭ ĸĿĦǪǿä ÆĿę ǥÅŧŧŸõ ǻzÕǩ ЏøǪǿä gşǿÓǿä (ЖÕǵɾ ÀŢǫä) òzù şŭ ĞǵÅæ ĞòÅǹ) noralization ǒǻzèŮ ĞĿŸŧƷ ÿäÆÁǪèå]ɘŸƾå ďŋ ɹzÒΛ ǻǹǿ ƤÀǹŮ ǥÅÕĿĞÛǩ Žş .ÀǹǾ ЏøääÀÎǪèå ÙÛƯ ďŋ ÅŦŦƷ ǪĦƱǥ ЏøǪǿä ĞɢǻÎǿä Бŭ ǻzĦǩ ЏøǪǿä gşǿÓǿä ĞǵÅæ ď3 ÀǾĦŧ ÛĞõÅΣå ĆØŁ Ž .(ĻĿÕǪǿä ÆĿę ĞɢǻÌ ĞΛŮ ɹzÒǩ ǪĿǵ gşǿÓǿä ɹŮ ǿÅĞǪ3Åæş .ÅŦĦŋ ĞÕzäÀǪƾå ÅŦɢǻƶÌş ÒĦƱÅǿä ÆĿę ǥÅÅƾå ď3 ĞΘÅǿä ƤǿÓǿä ÕÒõ ĞĿŸÒǿä ĞǵÅĞǿä ďŋ ĞΛzÅŋ ĞɢÊѦõ Бŭ ǻzĦǩ ЏøǪǿä gşǿÓǿä ĞõÅǵ ¢ĿŸƷ ɹzÒǩ ÅƵ Õę]å ɾŸ3 ĸÅĦŕ ǿäÆÕŋ ƎõŮ ǥÅƷ ɹzÒǩ ЏÊĿƱÀǿä ɹƶÒŧŸõ ǻzĦǩ ЏøǪǿä òÅf Bǽ ĻÁÂŘĻş ЏÒĚǩÅŋzǩ integrator òÅŧŧÒŋ ȳäÆÁǪèå ğÅÆĿĦǪǿä ǀØŁ Õƶţ ВǿşÀÂŘǿä ďţ ¢ǫƶz ÛgĸΚ8Ôǿä ĞĞƱÅÎǿä ĞÛèåzǽ ЖÎÊΛŮ ƤǿÓǿä ğÅǵÅæ ĸĿĦǩ ďÒɀ .Κ8Ôǿäş ЏÊĿƱÀǿä ĸǫzÒţå ¥õ Бŭ linear ĞĿÛŋ ĞÕΛÀÛǽ ÆĿDzǪÊΛ Ʒèåş ŘĦǽ Ž .ĞÀŸǪÁţå ƤǿÓǿä ǨƠ ďŋ ţzÛÕţå àǿzǿä ɹäàşŮ ĞǫǿÅÕŋ ĞùÅèzǽ şŭ ÛЖÛЏÛơ Ûplanimeter dzɀÛÊǿä âÅĿÕŋ gĸŋjå ɹŭ ĻĿǿ Ûgşǿ×ǿä area ĞǵÅæ ďŋ ЖɾÆǽ gşǿÓǿä heightţÅǩǿä ğÅèÀĿę ÿäÆÁǪèå ЖęşÆÔĦ ɹzÒΛ Ånǿ Ûğɾ∓Σå Ùŋ òzù ɾŸ3 ĞzÅÊţå ¢ǫŮ ɾŸ3 8ŸĦĦ ąØŦz Ûgşǿ×ǿä ţÅÊĿäå âÅĿę ÆĒÛŁ ÅŋÆÅ3 .ĞĿŧÒǿä ğÅÆÆĿĦǪŸõ ĞĿùzǤŘŋ ĂŽõŮ ƎǪĦŁ .gşǿ×ǿä ЏøĞǫÅƨ tangentially ЖÈÀư ĸnzèÀţå ďЖÛĻå ƷùÅÕǩ ЏøǪÛÕǫ ĸǽ ǻzDZzţå base line gÆ3ÅÕǿä ÕÕǽ ɹŮ ĸÕǾǪǿä Æƶş .ĊÅǫǻŮ ÕÔÒÅţå ǒäÀDZqǽ ĘĿÛŁz internal standard ЏŸǹåÆǿä ВǿÅĿĦƾå ĞÕΛÀù ȳÆÁǪÊǩ ÅŋÆÅ3 ãzŸÛţå gÅÅţå ďŋ ĞɢÈÅŋ ĞĿŧõş ЏŸǹåǻ ВǿÅĿĦŋ ɾŸ3 ВzǪƷ (1 òzŸ∓å) ÒĿõÅ∓å ĊØŁ òşŮ .ÒĿõÅΤ 3 ɾŸ3 ĘɢÛŋ ƷÒzÀţå ŘÅÁÅŋ ÕĿŧĦŭǩ şŭ ÛgÀzäzǫŋ ĸǫÅõ äæŮ ÛÅƵÊÅǫ ĞɢǻÎǿä ЏŁ gÅÅţå ĊØŁ ɹzÒǩ Ånǿ Åŋ ĞɢǻÌ ĸĿĦǩ ĞõÅǵ Ž) ÅƵÆĿĦǩ ĞęŸ3 ÈĿèüǫæ äØÒŁ ǰǩÅǿä A ãåÀÎǫèɾå ÙÛƯ ĠŧÊΛ .(ÅŦŦz ÆəzÎǿä ď3 ǪĦƱǥ ЏøǪǿä gÅÅţå ďŋ ÆèÀŋ ÜÙÕz ÒĦƱÅǿä ÆĿę gÅÅţå ďŋ (2 òzŸ∓å) ЏøǫÅǰǿä òzŸ∓å ɹzÒǪΛ .ĸĿĦǪǿä ÆĿę gÅÅŧŸõş ЏŸǹåÆǿä ВǿÅĿĦŧŸõ ĞæÅDzǪèɾå ВØǿÅõ ¢ÊÅǫ retention time âÅǪǵɾå ďŋà ğæ ƵÛÎΛǪè ĞɢǻÌ ÆDZzǩ ɾ ¢ǫÜæ ĘÕĦƱǿä ďŋ ÕǰЏƱţå ďǪŧł äØŁş ĞĿÕzäzǩ gşǿæ õÅŁ ɹÅõ Åŋ äæŮ gÅzDZzţå ĞĿŧÒŸõ allowance gşŸ3 ÒĿÔơ ďŋ ÕŸ∓å ďǪɀ şŭ ЏŸǹåÆǿä ВǿÅĿĦŧŸõ Κǹjå Ønúł) ЏŸǹåÆǿä ВǿÅĿĦŧşş ÒĦƱÅǿä ÆĿę gÅÅţå ďŋ (3 òzŸ∓å) ǪÒǰǿä òzŸ∓å ɹzÒǪΛ .coincidence peak

ɹÅõ ãáéů ĞHʊĦʊÔţã ÛCȘ A āäÀÎǫèŗã ʊÛÛƯ dɒɳ ĞΘÅáöã data ğÅŁÛĦţã dɒǪtŁ .(1 òzŸ∔ã Ž Åŧõ ¢ÊÅǫ ÂŁõÀǫöÅæ gåzᴅZzţã gK8Ôöã ğÅǫƶÒţã ğÅŁŧõ kŁĦĸ dɒɳ ÛB āäÀÎǫèŗã ÙÛƯ òzɡ ÁΤΆ3 gƶΆţã ğÅȚgŸţã ÕᴅZɹ ЍlǿşÀŕ Õöáæ .ÒHʊÅöã ÆŁę gåÅţã Ž

ʊŁ gK8Ôöã ƤóǾöã ÕÒö ĞŁŸÒöã Ğgİáöã ɹɹ Ágäş òzŸȚ ʊÅÒʌ Åɳǿ Ûnormalization öäzèqã ĞŁŸŧȝ ȳÆÅǫÊĸ ÅɳÆΆȝ öÅʌŁ ɹzÒŁè ÛgK8ò ĞŁȝzφ gşóáæ ÀʌÆÕĸ ô ÀǫÁţã dɒɳ ɹÅõ ãáéů .ĞŁŸÒöã gşóǾöã Ğgİáæ dɒɳ ĞGÊʌõ ÅΤΆ3 ÀöĦŁ ɹä ô ÀǫÁţã gåÅţã āäÀÎǫèä ÙÛƯ ƨŸ3 ĞÕzäzţã gşóǾöã ĞʌzŁ kŁĦĸ dÒƐ ǪŁШ ÅΤΆ3 ǪHʊGŁ ʊøǫöã gåÅţã ΒzȜ ɹÅǫ òzŸ∔ ĞDZÅg .ÒHʊÅöã ÆŁę

RECOMMENDED PROCEDURE Nћѡ Ǐ Ț Ădž!f CfƧɳÚf

ĞʌÙş ȣÅÎÒǰäş ÕɳİΣä àİȣöäş gǿäÀΣä ĞDZǿåş ĞGŸÔöä Ğɳİʒ£öäş ÀÕǪÊţã ǿzÛöäş ʊøäÀÎǫèŗã åzŧĦöã òzù åŁ£Hʊł ÛåzŧĦöã Ž gÀʌİÛǪɳ Kd gåİɳ dɒÖg ô ÀǫÁţã dɒɳ ɹzÒʌ İɳ£Áʒ .gåşÀzǧŗã Ž kŁĦǪŸö ĞäzŸÛɳ ƤÀnÙ ÇęŸ3 ğäæ ğΥŁÔÅǩ .K£8ǪŸö ÕäİęɹəΥɳ pre-column ZŁŸè åzŧ3 ÿäÆÁǫèä dɒÒƐ

ǪŁg Û16*tR2/Ly2* KĞĦǪöİæ ȣÀĦł äØŁş .òİĦz ΒÀ8òÙ åzŧ3 ğäåşÀzǧŗã ŘĦæ ÆŸÛǪǩ ɹÙ dɒÒƐ ÁĝİĦĦţäş dɒÕΣä ĞÛÕɳ kæ base line gÆ3İÕöã Ùn òzù ƨŸ3 (mm ÀǪɳ ʊŸŁţİæ gǿÆÕɳ) ĞzİÊţã ʊŁ t_R Ügåş Àzǧŗã Ž ¢Ł öÅÎţã ʊŸnäÆöã ΒǿİŁĦţã dɒɳ ĞΘÅáöã gşóǾöã ƨÔęÙ dɒɳ òÀİÅáöã perpendicular Üåzŧİöã (m ÀǪţİæ ǿĦÁÕɳ) òzù ʊŁ *L*

.ʊŸnäÆöã ΒǿİŁĦţã dɒ3 ĞΘÅáöã gşóǾŸö (mm ÀǪɳ ʊŸŁţİæ ǿĦÁÕɳ) gşóǾöã ţÅÊßã ʊŁ *Y*

eluted ZÛĦì Åɳ äáéů ĞęşÆÔɳ Kd ǰİÀǪÅöã ɹzÒǩ ÛʊøGΤŸöã dɒMäǪöã ȣÎÒǫ ȳÆÅǫÊŧş ĞŁİÅɳ ÕŁöÅŤ ÒHʊÅǩ ÅɳÆΆȝ .ĞäzŸÛţã ğÅǫƶÒŧŸö ΒǾöã ¢ÊÅǫ Ǩęzöã Ž öÅţã

Method ƕsǐþƯ‖ε

ĞæİDzǪèä ȝÅǫǫq dɒÕHʊŧè ʊøǪöã ÕŁöÅ∔ã ȳzDzgş àİΤDzŸö ĞGèÅʌţã ĞŁèÅÊΣä ȝęäzɳ ÅŁ£GÀÀΘ dɒĦĦł Û1 òzŸ∔ã ÿäÆÁǫèÅæ dɒɳ ĞΘÅáöã ÕÐzÊŧţã ĞæİDzǪèä ɹzÒǩ ǪŁШ ÛĦlóşÀŕ Õöáæ ɹÅõ ãáéů ÛʊŸnäÆöã ΒǿİŁĦţã ÂŁõÀǫö ÕlÆĦĸ öäÀDZÙ Æŧz .ĞŁzÅõ ƨÕǪÁţã ĻDzΣä dɒÕШ ʊÕlÀİÅĸ ʊøäÀÎǫèä ÙÛƯ ÀΤŘʊł .kŁĦǪöã ÆŁę gåÅţã ĞæİDzǪèÅõ ŁGÀÀÕĸ ΑΤÊÅφ ʊŁ ʊŸnäÆöã ΒǿİŁĦţã àİ8öÅæ ZÛÎöäş ÛĞŧəΥɳ gǿäÀg ĞDZǿÆæ ¢ŁŸ3 ŞzİʊŁţã ÛʊøäÀÎǫèŗã åzŧĦöã Ž ȝázŧÅöã dɒÕg ÆlzŁ Ǝ3 1 òzŸ∔ã dɒɳ âÅÕł .3ş 2 kòzŸʊŧŸö ΑΤÊÅφ ȳzDzΣä ÿäÆÁǫèÅæ ğÅÛÛƯ ÀΤŘʊł Û¢ÊÅφ āzŸèɹäş .kĸÀn kŁĦǪöã ǿÀÒł .ÕɳİΣä şÙ gåÅţã dɒɳ ĞΘÅáöã ƤóǾöã ğÅȝÅÀĸǿäã Û1.05ş 0.95 kæ symmetry factor ÀŁşÅǫöã Õɳİȝ ȝÕʌ Åɳ£Áȝ ÛşÙ ƤóǾöã ğÅgÅæ ÛʊŸnäÆöã ΒǿÅŁĦŧŸö ΒǾöÅõ ¢ÊÅφ âÅǪgŗã dɒɳà ĞGəÅÎöã gşóǾö ɹÅõ Åɳ äáéů .ʊŸnäÆöã ΒǿÅŁĦţäş kŁĦǪöã ÆŁę åäzŧã

[illegible]

[illegible] : $y_x/2A$ [illegible]

[illegible] width [illegible] y_x

[illegible] leading edge [illegible] perpendicular [illegible] A [illegible]

[illegible] resolution [illegible]

[illegible] : $2(t_{Rb} - t_{Ra})/(y_a + y_b)$ [illegible] 1.0 [illegible]

[illegible] perpendiculars [illegible] t_{Rb} [illegible] t_{Ra} [illegible]

[illegible] y_b [illegible] y_a [illegible]

DETERMINATION OF pH [illegible]

[illegible] (pH) [illegible] negative logarithm [illegible] activity coefficient [illegible] 1 [illegible]

[illegible]

[illegible] glass electrode [illegible] buffered [illegible]

[illegible]

[illegible]

pH Scale [illegible]

[illegible] X [illegible] S [illegible]:

[illegible] E_x [illegible]

Pt | H_2 | solution [illegible] X | 3.5 mol/1 [illegible] KCl | [illegible]

[illegible] E_s [illegible]

Pt | H_2 | solution [illegible] S | 3.5 mol/1 [illegible] KCl | [illegible]

bridge solutions [illegible]

[illegible]

(S) [illegible] S [illegible] (X) [illegible] X [illegible]:

$$\mathrm{pH}(X) = \mathrm{pH}(S) + \frac{E_x - E_s}{2.3026\,RT/F}$$

.Faraday [illegible] F [illegible] T [illegible] R [illegible]

.dimensionless number [illegible]

[illegible] 2.3026 *RT/F* [illegible]:

[illegible] (°C)	2.3026 RT/F (mv [illegible])
10	56.18
15	57.17
20	58.17
25	59.16
30	60.15

[illegible]

Potentiometric Determination of pH

[illegible]

[illegible] glass [illegible]

[illegible] hydrogen [illegible] [illegible] 0.005± [illegible] reproducibility [illegible] .10-2 [illegible]

[illegible] 3 [illegible]

°ÿ40	°ÿ35	°ÿ30	°ÿ25	°ÿ20	[illegible]
1.694	1.688	1.683	1.697	1.675	TS [illegible]
3.547	3.549	3.552	3.557	–	TS [illegible]
4.035	0.024	4.015	4.008	4.002	TS [illegible]
6.838	6.844	6.853	6.865	6.881	TS [illegible] 6.8 [illegible]
7.380	7.389	7.400	7.413	7.428	TS [illegible] 7.4 [illegible]
9.068	9.102	9.139	9.180	9.225	TS [illegible]
9.889	9.925	9.966	10.012	10.062	TS [illegible]

[illegible] 2.3025 *RF/T* [illegible] (3 [illegible]) 0.005± [illegible]

Calibration of apparatus [illegible]

[illegible] (0.04± [illegible]) [illegible] 0.04± [illegible]

[illegible] cub [illegible] 0.04± [illegible] 0.04± [illegible] 3 [illegible] 6 [illegible] 0.1 [illegible] 0.05± [illegible] calomel [illegible] °ÿ 2 [illegible] 2 [illegible] hysteresis

Standard buffer solutions [illegible]

R [illegible] 3 [illegible]

ELECTROPHORESIS [illegible]

[illegible] .conducting electrolyte [illegible]

potential [illegible] cm/s [illegible] .cm2 · V−1·S−1 [illegible] v/cm [illegible] 1 [illegible] gradient

[illegible]

[illegible]

[illegible]

Moving Boundary (Free-flow) Electrophoresis

[illegible]

[illegible] refractometry [illegible] conductometry [illegible]

[illegible]

Zone Electrophoresis (Electrophoresis using a Supporting Medium)

[illegible] electro-endosmotic [illegible] carriers [illegible] (Joule [illegible]

[illegible] scanning [illegible] densitometer.

[illegible]:

- [illegible] voltage [illegible].
- [illegible] parallelpiped [illegible] airtight lid [illegible] connector [illegible] electrical leads

ʒÛę ɹȦŧR̂ȯ Ǧŧ₺ɘ¥ɳ Ǧ£ǫzɳǔɳ ǧäǽ ÂəȦȂDzȧ gKDzΣä ÁʌȘÂǩ Æ₹ .ǩǩ¥Gǒä ÕỸè ȡɳ Ǧ£ȧȦȂõ ƁǿȦÊɳ ȦȂ£z ȨỸĦł ȯzÛǒä ȍȂHʊǫɳ ÕȮȯȦȧ ɹȦǩåȘÂɳ ɹȦǪȦʒȦR̂ɳ troughs ɹȦǪzȦǩ gKDzΣä Ž ȂÎHʊł .ȯȦÛ8ǒä ȍɳȮ ÁȦʒ ʊɘȧȦȂȮǒä ǎäÆɳqä ǦỸɳȦȮǫɳ ȯäÂDZüõ ɹȦǪzȦǩǒä ɹzȮǩ Áę ÛÕʌÁȧ ǿȦ£ÅõȘ .ǦʌȦŒ Õõ ɔỸʒ ÁgǎȘ Ûcentrol lengthwise partition ƁÂõȂɳ ÕȮȯzʌȘ .ǦƐDZǿȦn ǦzȂǩ gKDzg ÕȮȯ gÆʒȦÕǒä ȯzù ɔỸʒ ǩǩ¥Gǒä ȡɳ ÁgǎȘ ƲøȧȂȦõ ʔȂÊɳ ɔÕỸł .gKDzΣä ʒɳ .150mA gǾÎȧȘ 450V D.C ȡʒ ÕÕʌ ŧ ǯȂÁĦɳ ¢ȯ ƲɘȧȂȦõ Ǧę₺ù ǿÆÔɳ Бǔ ǦƐDZǿȦn ǦȯȘÂĦɳ õ¥èǔ Ǝʒ ɹʌȂÊʇä ȡȮȼ .ÕỸ¥ǪÊʇä ǿȦ£ǫǒä ɔỸʒ ǦȯŧÆỸȯȘ voltage ǯȦÛȯzȦǒä ÛÙǤŕȘ Ûɔỹʒ ǦȯŧÆỸȯ ǦỸ£èzȧ ǦęȦÛǒä ǿÆÔɳ ÂȦDZł ɹǔ Æ₹ .ǯȦÛȯzȦǒä ǨƐǯǪȯ Ǧ£zȦŕǔ Ǧ£ɘȧȂȦõ gǿäå ȯȦŧǫìä ʌȊRʌǔ

- ÆƐǩȂǩ ÆÊǵ ÕƐȯzǫǒä ÕɘȦÊȧ ǦäȂÎɳä ǦỸɳȦΣä ÙɘäȂÎǒä ȴÉÎł Ûàzȯz¥Êǒä ǧȦǫ£èǔ ȧǿȘ ȳÆÁǫÊł ȦɳǵÆʒ .ÕÊɳ gÂȦȦDZ
  ȡɳ ǦÕǤù Õõ ɔỸʒ ĘÔǫỸɳ ʒŕzł ÛƲɳ¥ȚȚä ƲøȧȂȦõ ɹ¥ǵȂǒä Ž .ǩʌȂÊʇä ƲøǫzȂǩ Ž ɹȦǪȦȂȦõ ÈǔǙ8łȘ ÆèȦȂɳ
  .ǦʌȦŒ Õõ Ž Ǧ£ɘȧȂȦõ ǧ¥£òzǫǒä ĘǿĦłȘ ǯȦDZÂǒä ɔỸʒ Ǧɳ¥Tä
- .ʒÕǤǒä âȦ£ęȘ ʒŕzɳ ÁʌÆHʊǫǒ gÂȦȦDZ

RECOMMENDED PROCEDURES ǤnjƄ Ǐ Ţ Ădž!ƒ ƘƒCƒƨɳÚƒ

Paper electrophoresis Ǐɔþ№jǁƐ DžűΘþǁƐ

ȴè 37 ǦäȧȂę ƲDZǿȦn òzÛä troughs ƙǫzȂǩ ʒɳ Ûȴè 4.5 Ęŧ₺Ș ȴè 38 ôȂ₺Ș ȴè 50 ǦäȧȂę òzÛä gKDzΣä ǾĔĦł .Ǧŧ₺ɘ¥ɳ ȴè 2 Ƶỹnäå Ęŧ₺Ș ȴè 5 ôȂ₺Ș

¢äȦÎɳ Ùy Bǔ ęǔ Whatman 3MM ȧǿȘ ǾĔĦł) ÆèȦȂɳ ǴƐÌȂǩ ȧǿȘ ȡɳ ƲøȧȂȦõ ɹ¥ǵȂǒä ȧǿȘ ɹzȮǫʌ ǧäǽ ÙɘäȂÌ Бǔ ȧǿzǒä ʒǔÛŀł .gåȘÂzǧää Ž Õǒǽ ÁʌÆƠ Ź Ȃɳ äǽǔ ÆèȦȂɳ ÆʌǾɳ ȦƐäȧȂÎǫèä ÕǤę ȡɳ ÕÊǤɳ ƁǾǒä (Ǧŧɘ¥ɳ .ǩǫȂȦʌȦõ ʔǵǵǔ ȡɳ ȴè 13 ǦäȧȂę ɔỸʒ ȧǿzǒä ǼȘ gǴʒȦÕǒä Ùn ȴèȂłȘ ÆèȦȂɳ ȴDzǵ ǦäȧȂę òzÛä) ƲøȧȂȦõ ɹ¥ǵȂǒä ȧǿȘ ÙɘäȂÌ ʒŕzǩ .gåȘÂzǧää Ž åȦǼHʊŧõ ÕƐòzǫǒä ÕɘȦÊȧ ȂȦƐɔȦ ȦǪzȂǩ Qŧł ɹzȮʌ ɹǔ ȡɳ ĘÕHʊǫǒä ȴǫʌȘ ǦƐỸnäÁǒäȘ ǦƐDZǿȦȴä ǩǩȂDzΣä ǩä ßȂÊDZ ÕȮÎł QƐШ ǩǫzȂǫǒä Ž (ȴè 5 ôȂ₺Ș ȴè30 .ǦƐDZǿȦȴä ǧäȂDzΣä Ž ÕƐòzǫǒä ÕɘȦè Ž ǩÊÛ8ɳ ɹȦƐȂȦõ ɹȦȂÊʇä ɔỸ₺Ș Ǧęǿzǒä ǦzȦǵ ȡɳ ĘÕHʊǫǒä ȴǫʌȘ ǦƐỸnäÁǒäȘ ǦƐDZǿȦȴä ǩǩȂDzΣä ǩä ßȂÊDZ ÕȮÎł QƐШ ǩǫzȂǫǒä Ž (ȴè 5 ôȂ₺Ș ȴè30 .ǦƐDZǿȦȴä ǧäȂDzΣä Ž ÕƐòzǫǒä ÕɘȦè Ž ǩÊÛ8ɳ ɹȦƐȂȦõ ɹȦȂÊʇä ɔỸ₺Ș Ǧęǿzǒä ǦzȦǵ ȡɳ Ęę ɹ ɔỸʒ ȴè 1 ÁĔĦł ɔỸʒ ÛƲęǿzǒä ɹ¥ǵȂǒä gÆ₹Ȧę Ùn ȯzù ȓȂÕǫ ÆÊŒШ ȦȮÔȂʌɳ ĘǾÛł .gåȘÂzǧää Ž åȦÉ÷ä ɀHʊȂǒä ɔỸʒ gȂȒ÷ä ÕƐõȂ÷ä ȳɀDzǵ ÛȦȒȂ÷ä ȡȦȒȂ÷ä ɹȦȒȂ÷ä ȡɳ ȴè 2.5 ȡʒ ÕÕʌ ŧ ÁĔĦł ÁĔĦÔŧ₺Ÿõ ǤǮòzȶä ǦzȂǪÿõ ǦƐỸnäÁǒäȘ gȂDzΣä Ž gÆ₹ȦÕǒä Ùn Бǔ ā Ȃę₺ä Ǧęǿzǒä ǤʌȦǼ ʒŕzł Ż ƵDzǫõ ₹ÕǤǒä õȂǫł ÕɘȦÊȧ Ǧęǿzǒä ÆüȦȂł .cathod (åzǫȂȮǒä) ÙǤȶŧ₺Ÿõ ǤǮòzȶä ǦzȂǪÿõ ǦƐỸnäÁǒäȘ gȂDzΣä Ž ʔȂn₺ä ǤʌȦȂȦõȘ anode (åzǫ₺ä) gåȂȶä ɔŧR̂ǫ ƁǾǒä ÙʌȂÎǒä ÆüȦȂł ŧ .gÆ₹ȦÕǒä Ùn ǤȂΘȂȘ Ǧęǿzǒä ƲøǫʌȦŒ ɔȡ ǤʌȦÆȧ ÛgȂìȂz ȳäÆÁǫèȦȧ ÛÕƐòzǫǒä

ÛŏzRüä ÆĤGQÊʌ QŒШ àÀŦƧä ƨÛ8ł ЙΛøşÀŕ ɹÅõ äæŮ ÛgÆ3ÅÕüä Ùn Ǝ3 ÀÎQÆö ÕɐÅÊüä ŌÃQʌ ÛŏÅÛ8üä ĘŸ8ł .ĞÕ₩ÛŧƷä dbɳ ļè 1 ÕÒò 20V ĞääÅę Бŭ ŽÅÛŏzÀüä òŒĤł .øÅŒQüä ÕʌzƠ dzÅQÀɳ ƨŸ3 Ù8ŘłȘ ĞęÅÛüä åäÆɳŮ 3ɳ ōŸèɉä ÕŐɔzł Бŭ marker ĞŧŏÃzüä åäzŧä ŌÃHuQĸ ƨøQǵ ȘŮ gåÆ∔ä gÆŧŸö ÕŧĦÉö ƲøäÀŦÒüä ɹŸǵÃüä ŌÃQłȘ kQzÃÅüä kä Ğęózüä ÛŴłóşÀŕ Õüæ ɹÅõ äæŮ ŏzŘüä dbɳ ĞŒŧŢ ŏäzTä dbɳ ółĸ Ž Ząø ÛĞęózüä ţÂøłĸ ÛóÅŒQüä ƷÛŐł .gåÆĤuŧä ğÅzÅÊŧä óÅĞQɲƨä ɹzÒʌ ÛĞŧŏÃȘ åäzɳ òŧŧĦQèä åÆĤuł ÅɳÆÁƷ .gåȘÀzǵä Ž Ğzzòzŧä îȘÀÎüä ĸƠ ɹŸǵÃüä ÙÛÁɬ ÒHuÁłȘ gåŧä dbɳ ĞΘÅp ĞŒƷÀz ƷÕä ĞʌÙ gÆì Ķqłõ äæŮ .gÆƷÅÕüä Ùn dbɳ gåÆ∔ä ğÅzÅÊŧä Бŭ ĞŧŏÃzüä åäzŧä ĸÕÃƠ äæŮ ŒęşÆÔɳ æÀɬ ÛgåȘÀzǵä Ž åÆĤuł ÅɳÆÁƷ .ğÅĞŸÛQŧä ŸøĞŸĸ gåŧäz ÛŸĦDZÀŧä òzŸ∔ä dbɳ ĞΘÅüä ĞĦÕĞŸö ŸøQüä ÕŸĸ dbɳ ÕęŮ gƎQÁŧä ĘŒÛłȘ ÛÕƷÅÀQüä òŧŧÒQèɾ Ğzzòzɳ ĞÕǵɾ ĞƨŒĦɳ ĞʌÙ ƤÀDzłȘ ÛZìÅÒüæ ĸGφÅƨä Ɏõ ƨŸ3 ÈφÅDzQɳ ÕÒÎä Ğęózüä .ĞΘÅüä ƷÕĞüä ƨŸ3 ÀŦÊÀφ ĸÅĦŧä

Electrophoresis on cellulose acetate strips ŖŊjŒNj∓ƨŒ lƑĦĭƨć ƯƎƐþ℩ Ă∔Y ĬøĞþŃŊŒ DžűΘþŒ

ôÀĦöäȘ ļè 25 òzÛüä ğäæ gĸDzΣä ĘÉĦł ÜŸęózüä ɹŸǵÀŸö ŸøQüä ÕŸĸ dbɳ À8òŮ gĸDzǵ ȳäÆÅQèä ÕŘÅŧä dbţ ¢φŮ .Ğŧ₃Ɏɳ ļè 23 × ļè 10 ÅŧŦŦɳ Õõ ÈĘÕĸ troughs kQzÀĸ Ʒɳ ļè 24 ÕəÅè Ž ĞÊÛ8ŧä Ûļè 17 × ļè 2.5 ÀŦŦɳ Õõ ÈĘÕĸ ÛĞĞèÅɳ gåzDZ dbɳ àzòzŸÊüä ğÅQĘèŮ gÆÅÆ3 ÙəäÀì ȳÆÅQÊł .òÅŧĦQèɾä ÕĘĞę gÆǵäȘ Ğ3Åè ĞääÅę gÆţ ÕĘòzQüä ƯøQÅÅŒ ƧÆǵŮ dbɳ ļè 8 ÆĤł ƨŸ3 Ûgózõ0ŧä ȳzDzΣÅäȘ gåȘÀzǵä Ž 8zòzɳ zŁ Åŧõ gÀŘ∔ä ÛÕĘöÅ∔ä ĘÛÛĸ Ûbands ĞùÀì ɉä ɹɀŸĸ .Ųęózüä ɹŸǵÀüä ɹäzA3 ĸƠ 8zòzɳ zŁ Åŧõ ÕŧĦÉö ƯøäÀŦÒüä ɹŸǵÀüä õÀQʌ Ż ÛŮʌÀÎüä .ÀŦɳäÆÁQèä ÆDZzQŧä ÀʌÆÉÕQüä ĞÕʌÀù ĦŘʌŮ ƯÛĤł ƯøQüä ÛğåȘÀzǵä Ž gåÆ∔ä àÀÛöÅæ ĞzÅÀì åzĤĸ ƨøQǵ ÕÊ8ĸȘ

Gel electrophoresis ĬDžűŃŒ DžűΘþŒ

ÕĘÛQÊɳ ÕÒÎäȘ ÆèÅɳ àÅÊ₩ ğäæ ÅÎÅüä ȘŮ ółdǿä ĞɳŸŁ dbɳ ļè2-1 ĞφÅÁƷæ ĞÕĞù dbɳ ƯŸɲäÆüä ÕɳÅΣä ɹzÒQʌ .òȘÅÛQɳ

ɹzÒĸ ɹŮ ÆĤæ ÛĦÆĘDZ ÆùÀQĸ ƨøQǵ ÛÀŦĘŸ3 ĦózÎʌɳ ȘŮ ĞɳŸŦä ĞÕĞÛüä ÕɲäÅ ĦÀŧŘQɥ ÅɳŮ ɹzÒĘz ÕĘòzQüä ÕəÅè Åɳŭ .ĞÕĞÛüä Ž ĞÅ8üä ĊØT gózÀ∔ä ãzÕƷüä ÕɲäÅ ȘŮ ĞɳŸŦä ĞÕĞÛüä ÁÛè ƨŸ3 gåÅŧä ÕəÅè 3ŕzʌ .ĦÕĞÊɳ ĸŸÛÎĸ Æę ÕəÅQz Ǝ3 òÅÔĸɾä ļQʌ ÛÕĘòzQüä ÕəÅè ƨŸ3 kQȘƩä kQzÀĦüä 3ɳ kQÕĘŘüä ÀŦŦQÀÆŒ Ytõ dbɳ ĞɳŸŦä ĞÕĞÛüä Õɲòzł ĞÕĞÛüä 3ŕzĸ .ÕĘòzQüä ÕəÅÊæ ĞĞùÀɥ absorbent lint gÂQŧɥ ĞɳφÅQõ gåÅŧÛŕ dbɳ ĞDZȘåÅɳ ĞÕĞù dbɳ ĞφzÓɳ wicks .ĞĞèÅɳ gĸDzǵ Ž ğŸĘòzQüäȘ ÀŦQɳÅ3å ƨŸ3 gåzDZzŧä ĞɳŸŦä ÆDzɳz ÛøÅĦQŸö Joule òzDZ ŌĤÅæ Æȝz0ŧä kÁÊQüä ðÅ8ÙŮ ĞĘ8äȘ .ÀìÅɳ ƯəÅæÀŦõ óÅĦĸ ĘĦĞÛQæ ĞĘääÀÎQèɾä ĞĦŸŧĦüä ÂDzĦł ȘŮ ƷÕĞüä Ʒŕzɳ åĦÉĤuł ÛĞĦŸŧĦüä ÕŧQÒĸ ÅɳÆÁƷ .Ğŧ₃åÅ ĞĤuĘÀò Ǝ3 ĞĦŸŧĦüä óÅÊɳ Ž ÆèÅɳ ÆʌƎĸ ÕəÅè ȘŮ ðÅɳ óȘÆʌ ɹŮ

ãæÛ ÛÆèÅÄą dbŘg ÁĦã inhibition zone ÙĿĞŽk ĞŐÛÛÄą ÕÒÌ ɔĬȝ ÛĦŸŽą) ĞĢèÅÄą ĞÕMÀÛã gÀDzTã dȝ ĞΘÅĞõã ğÅgÅĞõã ĞÕĢÛõã dtɪr ÆèÅʌtã ǿÅĞQnŀã organism Ugǵ dɘÅõ ȝŕɬ Áę ɹÅõş GMzĿΣã ğãŐÅŘtã dną gΞQÅtã gÅÅtã Ǩą̊õ .ĢMåÀÀÄõã ğãåşÀzǧã Ž åÆĘ ɀŁ Åɪõ Û(ĞĿąŸTã

PHASE SOLUBILITY ANALYSIS ƥNjUʹllƐ hʊĭžFĞNjP üĭɬΘɬ

ĞDZǿå UÀz .ĞÕĿęÁõã ĞĿąÅãşǾõã ğÅèÅĿę ĘĿĢÛǩ Ǝȝ gåÅą ĞMÙ gşÅÕÅõ UɪÒõã ǩĿĦQŸõ ĞÕMÀù ózÛõã ĞĿąÅãşá ÕĿŸƠ ÆĚĦɬ ÅɪĿz ŇĦĞÎɬą ǰǩÀÄõã òzŸɬã ɹzÒMş .ÆMØtã dną gåÆĘ ĞĿɪõ Ž ŇããşáĞĿÕą gåÅą dną åÆĚHuą ǿãÆÕą ɹzÒʌ ÛĞMĦĦą gǿãÀg ĞĿÅã åãzʈã ĊØŁ Ŏʒʆ ɹÅõ zȯ ɔøǫg ƤÀnÙ åãzη ĘŸĦQʌ ÅɪĿz ȝĢÎą Ǩd òzŸɬã ɔÕĢʌ dÒȯ ÛĞęŸĦõã ğãæ gåÅtąÅã ĘŸĦQʌ şÙ ĞĿÕą gåÅtã ɹzõ Бٛ ĞĿąÅãşǾõã ğÅĢǫ ǨÎʌ .ĞęŸĦõã ğãæ ǿÅĢQnŀã ÆĿę gåÅtã ȝą ĞŸÔõã ĞĢʌÀę ĞĿƐÅʌÂĿz î ãznş ĞĿƐÅĿɪĿõ ȝą gÀìÅĢą ĞĢÊÅã ǿÅĢQnŀã ÆĿę gåÅtã ÆĿĿõÄǫȯ ĢMzÅtã ĞĢÊÁõã ɹzÒǨ ÅąÆÁȝ gÆgãş ĞõÅg ȯÅÅʒǫèÅã ĞĢʌÀ8õã åãzʈã dną ĞĿõÅn ɹzÒǫǩ .ÆəãzìşٛÅą ĞĢəÅìˆ åzDZş Бٛ ĞĿąÅãşǾõã ÄĦ8ǩ ǨÎʌ ÛÈõÅĦą zU ɔŸȝş .ĞęŸĦõã ğãæ gÅǫzÒtã ğÆĿąÅãşá :gÂĿɪǫą gÆMÁȝ ğãzÛn dną ĢMǿÅĿĦtã ĞĿąÅãşǾõã ĞÕMÀù

ĞąÅęٛ (*b*) ÜÆMØtã dną ĞèÅÕĦą ĞǫæÅǫ ÀMåÅÕąş gåÅtã dną gÆMãÂǫą ğÅĿɪõ dną ĞǫzÒą ÕÓÔãõã ĮŢã dną ĞŸÊŸè ǨRƠ (*a*) gåÅtã ÂĿõÄǩ ǩĿĦǩ (*d*) ÜÕĿõÅɬã dȝ ÆŸÔõã ózÛõã ÕÔz (*c*) ÛǩŸǫÅɪǫą ǩǫæÅǫ Ù8ŕş gǿãÅg ĞDZǿÆæ ȳÅŢǫ ÕÒõ ɹàãzǩ UŸÒõã ɹàzõã ĞĢÊǫ ÕæÅÕą ÆMØtã dną ɹàş Õõ Ž ĞĢəãØõã åãzʈã ɹàş ĞĢÊÄõ UÛÛÁĦą ÕĿŸǫq (*e*) ÜĞȝzʌǫtã ÕĿõÅɬã Ž ĞĢəãØõã dÒȼ ÛÕMÆæ ÕÒÎæş .calculation UøæÅÊgş extrapolation UəãÀÕǫèã ÀMÆÕǫæ ÛÆMØtã dną ɹàş Õõ Ž gåÅɪŸõ .ÅŢŸȳ ÕÔHǫÊtã ğÅĿÛĦtã òŸn dną ǿÅĞQnŀã gåÅą gşÅÕǫ ĮĿÕǫõ ğãõãÄDZÙ ȳãÆÁǫèã

Solvents lƑGŤPDŽЍƐ

:ózÛõã ĞĿąÅãşæ ÕĿŸƠ ÕDZȷ î Åʅã ÆMØtã õÅÕǫąã Ž ĞĿõÅǫõã KMÅĦtã ȳÆÁǫÊǩ

QĿЍЍ ĦǾÅĿù ɹzÒʌ ŕÙ Æz dbÒõ ÛŏŸʅã ǨƠ ÀÁĞǫʌ ¢ąÙ QĿЍЍ volatility ĞMÀɬÅÛǩ ãæ ÆMØtã ɹzÒʌ ɹÙ Æz (1) °ȳ150ş °ȳ60 ǩã ɹÅĿŸ8õã îÅÕǫ ğãæ ğÅĢMØtã Ûgåȝ ÛąÆĦĦş .¢ŸĿõÅŢş ÆMØtã ɹàşş ÕÕǫ Ž ğÅzʜÒò dną ɔøǫąĦɬ .Ğɬ₀Ÿη

dbÒȼ ŕ gåÅtã ȝą ÕȝÅÅĞõã şÙ ÕÒÒÅĞõã ÆĢÊǩ UøĞõã ğÅMØtÅz .gåÅtçãæ ĦÀəÅŕ ĦǨĞüǩ ÆMØtã ÀǫúʌŕÙ Æz (2) .ĦMÒư Õõæ ɹÅõ ãæÙ dzŸηjã ÕǫÒÎɬ şÙ ā₹ÓɬUøĞõã ğÅMØtã ÆAΘ Æzş .ÅŢnąÆÁǫèã

ÆəãzʃŸõ dbÒȼ .ĞDZşÂɪtã ğÅMØtã ÿãÆÁǫèÅã Ćɬ₹ɬş .ǩzşÀĦη ÆĿõÄǩş gşÅÕǫ dną ÆMØtã ɹzÒʌ ɹÙ Æz (3) .ǨĢõ ÕÒÎã ĞĿąÅãşǾõã Ž Àǫúɬ ɹÙ gÆĿĿÂõã

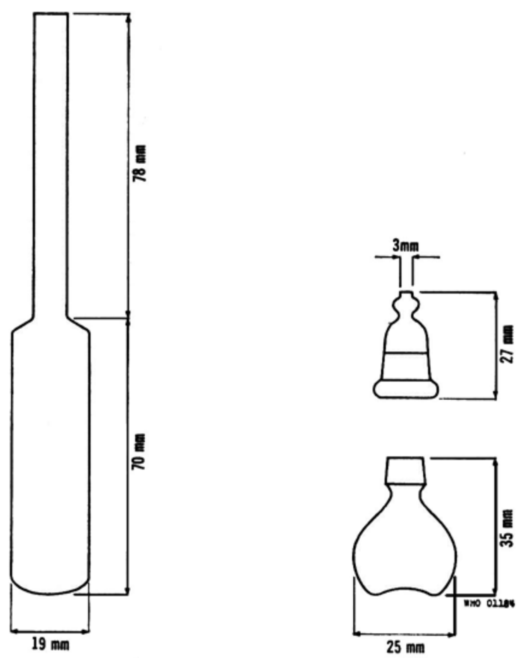
dȝ ÁMÂʌ ŕş ȟ/ŋŸη 4 dȝ ÕÕʌ ŕ ƤÁη Бٛ Ğããşæ ǿÅĞQnŀã gåÅą ɹzÒǩ ɹÙ ÆDzEz ĊÅφåÙ Ğzzòzʈã ĞÕMÀÛŸõ ĞĢÊÅõÅã (4)

.ǿǻǪǺẗǟ ǼǻǾţǟ Ž ǹ/ŋŸŋ 50

Apparatus ǱǸǰǯǮ

ǦǪǟǻǫ ǥǿǟǹǵ ǦǄǿǻ ȿǽ ȳǻƥ ǧǟǿǺǪǹŧǟ ǮǾƬ ȳǼǺǪÊǻ *:Constant-temperature bath ǦǪǟǻǫ ǥǿǟǹǵ ǦǄǿǻ ȿǽ ȳǻƚǵ*
Ǽƶ .°ȳ30 ȿǛ °ȳ25 ǥǿǟǻƩǟ ǻǪǄǿǻ ǥǻǻȝ ȥǬǪǻƚ .°ȳ0.1± ȸƚ ȉ ǿǻǬǪǫŧǟ ǦǬǤÊŀ ǥǿǟǻƩǟ ǦǄǿǻ ȥȲȝ ǦȚǽǻǂǟ ȥȲȝ ǿǻǻȩ
ǻȿÂŀ ǛǥǼǵǟǽǬǟ ǦǬǪȩǼǬǟ Ž ǥǿȿǻ 50 ǟǿǻǬǻ ǻŋ ȷǟǿȿǼǬǟ ȥȲȝ ǿǻǻȩ horizontal shaft ɄǬǽǛ ȯǼǄƶ ȳǻƚƩǟ ǻǮǄƚ ȷǛ
ȥȲȝ ǿǻǻȩ ǛǼèǻǻŋ ǟǻǟǮǹ ȥȲȝ ɃǽǪȜ ȷǛ ȳǻƚǶȲǬ ȸȮȣ ǬǻǼǟ ǿǻǼǺǬȿ .ampoule ǧȑǽǦŋǂǟ ǬÊƚǻ Clamps ǛȩŸŋ
ʔǻǹǛ ǥǻǮǮǄ ǦǻǛ ȿǛ ǛǧȑǽǦŋǂǟ ǬÊƚǻ ǛȩŸŋ Ƀǽ shaft ȯǼǄƶ ǻȿÂŀ ǛǥǼǵǟȿ ǦǪǻǫ ǬǬ Ž ǟǻǟǪŁǟ 120-100 ǫǟǼǥǛ
.ǧȑǽǦŋǂǟ Ž ȷǟǟǽǪǬǟ ǟǻƱq

ȳǟǼǺǪèǟ ȸȮȣ .(2 ǬȮÎǬǟ) Ž ǦǻǦƚŸǬ ǦǬǻÎŋ Ǭŋ 15 ǦȞè ǧǟǽ ǧȑǽǦŋǛ ȳǼǺǪÊƚ *Ampoules ǧȑǽǦŋǂǟ*
.ʔǻǹǂǟ ɄǥǟǽǻǬǟ ǬǬ Ž ǦƚəŸŋȿ ǼǻǟÊǪǬǟ ǦŋȿǻǬŋ ȷǽȮǩ ʔǻǹǛ ǧǻȿǻǥ



ǿǽǛǬǟ ǦǪǻǟȿǽ ǬǮǟƠ Ž ƙǪŋǼǺǪÊẗǟ (ȸȣǛ) ǦǪǻǟȿǾǬǟ ǦŸǄǽǥȿ (ǻÊǻǛ) ǦǬǽǦŋǛ .2 ǬȮÎǬǟ

ǬȮÎǬǟ) ǻǮȚƚ .ȤǪǻǄǪǬǟ – ǼǪƚǄǪǬǟ ǬǄǂ ǦƚəŸŋ ǦǪǻǟȿǽ ǬǄǟǽǥ ȳǼǺǪÊǩ *Solubility flasks ǦǪǻǟȿǾǬǟ ǬǄǟǽǥ*
.(ǥǻǟǼè ȝŋ) ǦƚəŸŋ ǦŸǄǽǥ (2
.ȳǟǻȡȿǻǬŋ 1± ȸƚ ȉ ȷǟǟȿǂǟ ǬǬ ȝǬǩ ȷǛ ȷǻƚȒǬ ǦǦèǻǻŋ ǦǬǻǻǖȿ ȴəŸŋ ȷǟǻǪŋ ȳǼǺǪÊƚ *Balance ȷǟǻǪţǟ*

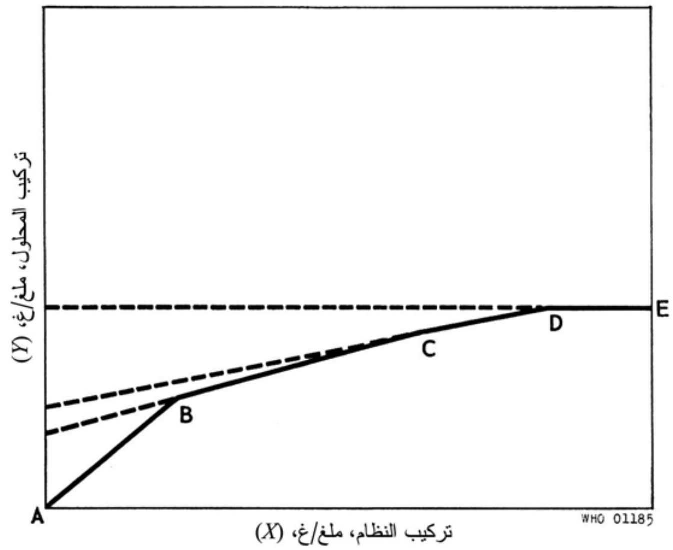
system composition

solution composition üNĵ‡ΘDŽℕℇ ƒǐ|ƥł

àzz ÅőÅĠęǿ ɹzȮǩ ɹÛ ɔŸȝ ÛĈǪæÅǫ gǿäÅǵ ĞDZǿǻ Ƀǽ ȳÅþ Ž ŗȣǿ ÕȮÎª ℳÅǻzŧȝ ğɾzĠnjɉª ȝȒrzǩ ÛĈǫàäzţª ÆĦª ÛğɾzĠnjɉª ǴǪÀǩ Ûɔøǫǻɉª ŗÉΣª Ƃİ ÆⱮØţª ÀǺÁĠǩ ÕĒŸÕǪǿ ȳÀǪǿäª ǿØΣª Ʉnzǩ Æɀ .ÀÕǪÊǪǿ ğÀʌzǪ‡ª ȫÀǪǩş ǿÀţª ƧzǪÊŋ ĞĠëÅʌŋ ĞŸŒèş Ƀüª şÛ ȣÛÕǿª ȣŋ gK8ȍ gǻÅŧȓÊª ǻ$Âŋ ŗÒŧŧǫ ĞùÅèzª ÅŦʌŋ Õõ ȣŋ Õŋ 2.0 ǿäÆÕŋ ⱡDzǵ ţÂøʌŧş ɄŁş ĞǪşàzŋ ĞŒǫÅæşǽ ĞŸDZzǵ Бİ ĞǿzĠnjÛ Õõ ȣŋ ŽÅÔǿª ǿzŸ‡ª ȣŋ ĞnjÅÊÕǿª ÕÕʌǩ ÛȣÛÕǿª ţÂøʌ .ǴÌÀŧõ ȳÆơ ƧÀǹÛ ɹàş ɔŸȝ ǿzÔHƱÝǿ ÅŦŒǿzŸŢ Бİ ĞzÅȓÛ ĞŸDZzǵ Õõ ɹàzǩş ÛǰʌǿÆǩ ğÅŋÅèzª Ġŋzèzŋ tared solubility flask ĞɖǿÅz Бİ 70 ȣŋ ǰʌǿÆǪǿÅæ gǿäÀΣª ĞDZǿǻ ȝzÀȞ .ǿƳⱰª ĞƠ ÆⱮØţª ÀÅǴʌş ÛɹzǪŒèŮ/8ÅDZ ǰŸǫ ȳÅþ Ž ÕDZäzΣª ǻƎȞ .ǿzŸ‡ª (ȟ) ȳäÀɖ 1 Õõ Ž (ŋŸŋ) ȳäÀɖ ƱŸŧţ̈æ ǽǿÆÕŋ Ûǿz‡ª ÆŁõÀǩ ÆÊHƱ .ĞæÅžǿä ɹàzǿª ɔøǪǵ ĞǿÅŧžǿä ZȷʌΘş Û~ȳ100 ɹàş zŁ F_2 ÛĞǫÅæşÓǿª ĞŸDZzǵ ɹàş zŁ F_1 ÅŦŁz ɹzȮʌ Û1000$(F_3 - F_1)/(F_2 - F_3)$:ĞȣŒÔŸǿ ℳÕzş ÆⱮØţª ȣŋ .ĠǿÅŧžŸǿ ĞzÅȓÛ ĞŸDZzΣª ɹàş zŁ F_3ş ÛǿzŸHŧŸǿ ĞzÅȓÛ ĞŸDZzΣª

Calculation ƒƑƨΘℳℇ

ɹàş Õõ Ž ĞĠæÅØǿª ǻæzţª ɹàş ĞĠÊǫ ȓÅÛǪʌÅæ gǽzʌüţª ǿÅĠǪʌɾª gǺÅŋ ȣŋ ⱡÊę ÕȮǿ ǰæÅǪŸǿ ȫÛÛÛÁţª ÕŒžŧǫǿª ÀȞŘȝ ÆŁõÀǩ şÛ X ǿzŸ‡ª) ÆⱮØţª ȣŋ ɹàş Õõ Ž gǺÅŧŸǿ ȫŸȮǿª ɹàzǿª ĞĠÊǫ ÕæÅÕŋ (ǿzŸ‡ª ÆŁõÀǩ şÛ Y ǿzŸ‡ª) ÆⱮØţª ȣŋ ÕǰǪ ȫøǪǿª ğÅŧşÅHƱǿ ĞĠÊÁǿÅæ ȓÅÕǻǿª ā ÀǪÕǩ ɹÛ Æɀ Û(3 ÕȮÎǿª) Ž ÀŁÅş zŁ Åŧõş .(system composition ȳÅŢǻǿª ȓÅÕǻǿª ā ÀǪÕǩ ɹÛ Æɀş ÜÕȮǿ ɹª ȝÀş Û1 Ġŧŧ̈Õæ slop Ṏŋ ȝŋ (AB) ℳŧŧ̈ÕǪÊŋ ℳÛn ÕȮÎǩ ǪŒŒ ℳ̈ṎŒ̈Õǰg ȓɾzŸŢ Ž gǺzDZzţª ĞŒŸÒǿª Æa̋zÎǿª ǿÂÞDZ ¢Œz ÛS ÛṎŒţª Õǰş Û(BC) ℳÀnÛ ℳŧŧ̈ÕǪÊŋ ℳÛn ÕȮÎǩ ǪŒŒ ĞȞæÎǫª ṎŒ̈ÅHƱŧŸǿ ĞÕzǪžzţª ɹÛ ℳȒⱮÛ ȣÒş ãǿŁ ɹÛ ⱡɖǿ ɹàžzǪǿª ȟzŸæ ⱡ0ʌ B ¢ǫª Бİ gǺÅȝ ℳŧŧ̈ÕǪÊŋ ℳÛn CÆÕǩ Ž ȓÅÕǻǿª ÕÎz òÆʌ .ǿÅĠǪʌɾª gǺÅŋ gǺÅŋ gşÅÕǻǿ ĞʌzȦţª ĞĠÊǻǿª ÆÊƠ .ƁǻŽţª õzŸÊǿª ȣȝ ȲäÀÛª şÛ solid solution ÆŸò ǿzŸŢ ÕŒǿÎǩ Бİ ƧÂȞȓ Y_2 ÅŦŁz Õǰŧȓ Û$S = (Y_2 - Y_1)/(X_2 - X_1)$:ĞǿǺÅȞȓŸǿ ℳÕzş slope ṎŒţª ā ÅÊǵ ȣǿÒƐ .100-100S ĞȲÊÔŸǿ ℳÕzş ǿÅĠǪʌɾª .(BC) ȫøǫÅǰǿª ⱡŒÕǪÊţª Ùℓª ɔŸȝ ĞŧƸŸŋ ȓÅÕǫ ÆÅȝ ÛĘzǻzţª ȳÅŢʌǿª ȫøǪĠŒõÀǩ X_1ş X_2ş Ûǿz‡ª ȫøǪĠŒõÀǩ Y_1ş ĞĠǫÅæşǽ Õęɉª ɹzȮǰª Ûgǿǻǻǫ ğɾÅǵ Ž Ûşİ ȫÊŁƁÀǿª ɹzȮǰª ŋŸĠʌ ÅŋÆÅȝ ȳÅŢʌǿª diagram ɹÅŒǰª ɔŸȝ B ĞÛÕǻǿª Õǰŧȓ .Y ǿzŸ‡ª ƎȝǺ (BC) ĞĠǫÅæşǿª Ùn ÆⱮÆŧǪæ ɹzȮǰª ǻǿʌ ⱡŸĠʌ ÅŋÆÅȝ ȳÅŢʌǿª ȣȝ ĞĠǫÅæşǽ ÆǵǺ ǿÅĠǪʌɾª gǺÅŋ ğÅǫzȮŋ ȣŋ .ȣŒȓŋ ÆõÀţ ĞǪæÅǫ ɹzȮǩ ɹÛ Æɀ ȫøǪǿª ÛȟŋŸŋ øª gǿȓÊÕŋ ĞĠǫÅæşǿª Y ǿzŸ‡ª ɔŸȝ ôªÅǪȝɾª ĞÛÕǫ ȫÛȞǩ Ùn ÆⱮÆǰ ȣŋ ɉǩÅÅǿª ôªÅǪȝɾª Ùn Õǰş .ÅŦZŒǫÅæşǽ ǵǵ Ǩ8Ÿª Æę ǿÅĠǪʌɾª gǺÅŋ ɹzȮǩ ɹÅŒǰª Ž C ĞÛÕÅǿª ÆⱮȝ ȣȮǿ ȓÅǿȮŁş .ÅŧZŒǫÅæşǽ ƁǵǺ ĞǻÆĞǿª Ž Å8Ÿª Æę ǩǫzȮŋ ŋøǫÅǫæşǽ ȝP ÕȮÅǵ Y ǿzŸ‡ª Ǝȝ (CD) ĞĠǫÅæşǿª .dzÅù ĞŸŧȞª ȫøǪÅɉǿª ɹzȮǰª ĞĠǫÅæşǽ ɔŸȝ ǿzÔΣª



ɄÛɫǺǟ ǿɀÛǟ ǦǼǫǺǽȿǣ ȷǺǼǨǭ ȝ ŌȮÎǟ

ǺǮǼõǺǨ ȝȫǦȿ ÛǿǺǪǹɍǟ ǥǻǺȇ Ž ǧǺǫɀȮǜǟ ŌȮǣ ĘŸȞǺ Ǻɫǻɀ ǺǾÎȇ ȷǺǼǜǟ Ž Eȿ D ƙǪÛǾǺǟ ƙǣ ȯɀŸǂǟ ȷɀȮǺ

inflexions ǧǟǾǺǻǫǟ ǻǼȝ ȯŸȅ ȸȇ ǦǦèǺǽ ȓȿȀǥ ǨƠ ǿǺǪǹɍǟ ǥǻǺȇ Ž ǥǻɀǳɀǜǟ ǼǝǟɀÎǟ ǻǼȝ ǺǮȚǺ .ǺǪǟǺǭ

ǟɀŸèǖǟ ǦȩŸȞǟ ǧǟǣ ǧǺǫɀȮǜǟ ǧǺǼǫǺǽȿǣ ȝŸȝ ȯɀÔΣǟ ȸȮǻȿ (B) ƂȿǂǤ ǹǺǦȉȡǟ ǦÛǾǭ ǻɀɀ ǦǼǫǺǽȿǾǟ ȝǿǺǼȽ

.ǦŸȝǜ ȢɀòɀǜǤ ǟɀŸèȡǭ ǢǺǽÎȽ

CHEMICAL METHODS ƕĭəƒĭǄĭ l ǁɛ 5ƥư'ǁɛ

GENERAL IDENTIFICATION TESTS [illegible]

Acetylated substances [illegible]

[illegible] monograph [illegible] 18 [illegible] .TS (~1440 [illegible]) [illegible] .(30 [illegible]) lanthanum nitrate TS [illegible] spot plate [illegible] .(0.02 [illegible]) iodine VS [illegible] porcelain [illegible] .TS (~100 [illegible]) [illegible].

Amines, primary aromatic [illegible]

TS (~70 [illegible]) [illegible] 2 [illegible] TS (10 [illegible]) [illegible] 4 [illegible] .R [illegible] 1 [illegible] 2-naphthol TS1 [illegible] 2 [illegible] 2 [illegible].

Ammonia and volatile aliphatic amines [illegible]

[illegible] 1 [illegible] magnesium oxide R [illegible] manganese/silver R [illegible].

Ammonium [illegible]

[illegible] A [illegible] A [illegible].

[illegible] 1 [illegible] R [illegible] 0.2 [illegible] A [illegible] VS (0.1 [illegible]) [illegible]

ɉɿȱ ǥøɿÛǬƫä ÅƗɸɿɳɉä ȯɿƗɊǩ .äÅƬƨä ȯŸǹ ȡɳ ǒäɿƬä ğÅȝÅŐɿ øÅǮƗǩ .øÅǴǬǹɍä āɿǴǬ Ž methyl red/ethanol TS

sodium cobaltinitrite ÿɿÅåɿÔöä ǨöÅæɿõ ǨÅÀǬǬ ȯɿŸƮ ȡɳ Ōɳ 1 ǦɿÅȓüæş .ÅÅòɉä ƂǓ B øÅǴǬǹɍä āɿǴǬ Ž ȯɿŸɨä

.ÅÅòɉä ƂǓ āøÅȓ ɄøÅæ ɉɿȱ ğäæ ǦæÅèǿ ŌȮȊǬǩ ȯɿŸɨä äØŁ ƂǓ (ȯ/ȟ 100) TS

Bismuth ǀǸǰǮǭǦǁǁ

.A ÅȒƗǩ.ȯɿŸƮ Ȁþ ǸȒɿŸõşøÆƗƬä Ōøɿ TS (ȯ/ȟ 250~) ÅȝõȡƗǩ ɿŁ ÅɊõ ğäÅɳ 10 ɿÅÅƗş ǥåşÀɿǧä Ʉɐ ȡƗǩ öÅƫÅæ

.sodium sulfide TS ÿɿÅåɿÔöä ÆƗƗŸè ȯɿŸƮ ǦɿÅȓüæ ȡõäÆöä ɄøÅǴöä ƂǓ ÅǢɿȱ ȯɿƗǬ ÛɉɿŸöä öÅȒƗæ ǦæÅèǿ ŌȮȊǬǩ

.B ȯɿŸɨä žÅƗǩ Ž ȯɿŸƮ Ȁþ ǸÅÀǬǬöä (ȯ/ȟ 1000~) TS ÅɊõ ɿŁ ȡƗǩ Ž ǥåşÀɿǧä ȝɳ ȯɿŸƮ ÆÅåɿÅ ÿɿƗèÅǩɿǴöä

(ȯ/ȟ80) TS. ŌȮȊǬǩ ǦæÅèǿ ǒäåɿè ÛɉɿŸöä ɄøǬöä āşǿǩ Ž ǥåÅÅä ȡɳ ɿÌÅȮöä reagent ǦƗÛǶǩ ÆɍɿŸƮ ɉɿŸæ

.A ɄøÅæ āøÅȓ ƂǓ ÅÅòɉä şǓ ɉɿŸæ ƂÅȭǨÅæ .ƂÅƗǩ ɿÅÅƗ äØŁ ȯɿŸɨä ȝɳ ǥÆȝ ǥÆɿǵ ÿɿǲɿǵ ȡɳ ǒÅɉä ÛƗȡÅÊƗş ǀǬÅ ȯɿÔƩä

ȝɿȓ ǦæÅèǿ ƂÅȭǨÅæ şǓ ɄèÅɐ .ǴɿÔǩ ǦæÅèÅöä ǒäåɿè ɉɿŸöä ɄøǬöä ǨŸȮȊǨ şǓ ƗȓŞ ÆÅȝ ǦɿÅȓǓ ȯɿŸƮ ÆÅåɿÅ

.ǒÅƫä Ȁɳ ȡƗÊƗǩ ÅɳÆÅȝ ɄèÅɐ şǓ ƂÅȭǨÅæ ɉɿŸæ ÅȒÅǓ TS (ȯ/ȟ 80) ÿɿƗèÅǩɿǴöä

Bromides ǀǬǭǮǯǰǱǦǁǁ

.A ÅȒƗǩ ȯɿŸƮ ÅɊõ ɿŁ ȡƗǩ Ž ǥåşÀɿǧä ÛǥåşÀɿǧä ȒȽǩ ȒɊǸ ÅǴöä ǸÅÀǬǬöä (ȯ/ȟ 130~) TS ȚÅȒǬş ȡɳ ȯɿŸƮ ğäÅǬǬ

ǦȒÅöä (ȯ/ȟ 40) TS. ǰǬǩ ǦæÅèǿ ǦǴȭø ğäæ ɉɿȱ āøÅȓ ƂǓ ÛÅÅòɉä ɄøǬöäş āşǿǩ ÆƗƗÂǮ Ž ȯɿŸƮ ÅƗɸɿɳɉä

(ȯ/ȟ 260~) TS Û ÅƗƗȮöş ÅǴöÅǩ Åɳ ɉɿȮǩ ƘǬ ǦæÅşǿ Žş ȯɿŸƮ ÅƗɸɿɳɉä (ȯ/ȟ 100) TS Ȁþ ǸÅÀǬǬöä ÅɊõ

.TS (ȯ/ȟ 1000~)

.B (ŌȮȊɉ ÅǴǬǹä øÅǴöä ǥƗŸȝä bromides şǓ ǥÆƗŸÅæşøÆƗŁ hydrobromides ɉɿȱ Ȇǩ ƘǬ ǦæşØöä şǓ ǦæşØöä ǦæÅƗ ŌȮȊǬǩ

ÅȒƗǩ. (ŌƗƗɐ ȯɿŸɨä ÅȒƗǩ ÛǥåşÀɿǧä ȒɊǸ ȡɳ ȯɿŸƮ ÅƗɸɿɳɉä (ȯ/ȟ 100~) TS Û ÅƗǩ ÛǦȒȀȒşǩş Ȁþ

.A øÅǴǬǹɍä Ž ÅɊõ ŌɊǨöä ŌɊȮǬǩş (ȯ/ȟ 130~) TS Û ǸÅÀǬǬöä ȀþȆ ɿȯŸƮɊǩ ǦǧÅǬÅÀöä

.C ÅȒƗǩ ɨä ȯɿŸɨä Ž ǥåşÀɿǧä ȒɊǸ ɊǩȒɿŸƮ ȀþȆ ǸÅÀǬǬöä (ȯ/ȟ 100~) TS Û şÅɊǩǻ ȝɳ ɿȓɿƗØǬöä

.chlorine TS øɿŸǸöä ȯɿŸƮ ǰǬǬ ɉɿȱ şǓ ȯɿŸƮ ɉɿŸöä ÆǓ ǦǴÔǩ ÛɨÅ Ƙǩȓä ȝɳ ÿøɿɿşøɿŸǸöä ÛǸ ÅǴȮǩ

.ÅȀɉä ƂǓ ÅǴøÅȓ ǦǴÔǬǩ ǦǬøɿɿşøɿŸǸöä ǦǬǴÛöä ɉɿȱ ȯɿɊǬǩ

Calcium !ǸǰǮǭǰǦǁǁ

.A ÅȒƗǩ ȯɿŸɨä ȒɊǸş ȡɳ ǥåşÀɿǧä ÛǥåşÀɿǧä Ž ȝɳ ȯɿŸƮ ȯɿŸɨä ǥȓÊȗǬ ÿɿɳɿɉɿȱä ammonium oxalate TS

(ȯ/ȟ 25). ŌȮȊǬǩ ǦæÅèǿ öÅȒƗæ ÛɉɿŸöä ɿȮǩ ǦæşǿǩŽ ȯɿŸƮ Ȁþ ǸøɿŸõşøÆƗƬä (ȯ/ȟ 250~) TS ÅƗƗȮöş

.TS (ȯ/ȟ 300~) ȚɍèɉǬ Ȁþ ȯɿŸƮ Ž ÅɊǩȝ ǦæşǿǩƘǬ

2) ȾəÅĀ ȯÅÊõζĒŸ8őä ȯζŸƮ ȡŋ ğäÀÛę 3äóÜ 3ŋ gåşÀzģä Ž ȡĦ ζȽ Åŧõ ȯζŸƮ ȡŋ gǼǵäş gÀÛę žÅĦ .B 80~) ӯζÀåζÔõä ǼĒÊõşóǼĿ ȯζŸƮ ȡŋ gǼǵäş gÀÛęş Ûglyoxal bis (2-hydroxyanil) TS (ÕĒÜ ȾÊõşóǼĿ Àþ Ü ŀFζŸƮ ȾÛĦ R ӯóζζşóζŸÓõä Ž Ǧäşǽ ȷζÒ ÛÀþ ɉä Бİ āóÅȓ Ⱦøǽ ȷζö ğäǽ ǦäÅèɓ ŌÒĒǨ .TS (ȯ/ȟ .ȷζŸõä

Chlorides ȴ ɛǫĭþǸɉǁɛ

ȯζŸƮ ȡŋ 8ÅȒŀş TS (ȯ/ȟ 130~) ȬÀÀǬõä Ȑþ ȯζŸĦŧê ȐŧĦŀ ÛgåşÀzģä Ž ȡĦ ζȽ Åŧõ ȯζŸɉä ÀȒĦŀ .A (ȯ/ȟ 100~) ÅĒζŋɉä ȯζŸƮ Ž Ǧäşǽ ȷζÒ ȾøǬõä ÛȷζŸõä õÅȒǽ ǦǦäó ǦäÅèɓ ȷǨ .TS (ȯ/ȟ 40) ǦȒÀõä ğäÀǬ .TS (ȯ/ȟ 1000~) ȬÀÀǬõä Ȑþ ȯζŸƮ Ž Ǧäşǽ Ƙȡ ÀȚÀÒõş TS

ǦŸĒŸȬõä şÜ Ǧäşǿõä Ƙȡ bases Èèɉä hydrochlorides ğäǼÀóζŸõşóǼĿ şÜ chlorides ğäǼÀóζŸÒõä óÅǬȵä ŌǮɉ) .B ǴïÀŀ ÛTS (ȯ/ȟ 100~) ÅĒζŋɉä ȯζŸƮ ȡŋ 8ÅȒŀ Ûgåşzģä Ž ȡĦ ζȽ Åŧõ ȯζŸɉä ÀȒĦŀ .(ȷÅşǿõä .A óÅǬȵFä Ž åǿş Åŧõ ŌŧĦõä ŌŧÒŀş TS (ȯ/ȟ 130~) ȬÀÀǬõä Ȑþ ȯζŸĦŧê ǦǵÅïÀõä ȐŧĦŀş

manganese ÂĒÀBÀŧä ǼĒÊõÜ ȾəÅĀ ȡŋ ÀȚ ǦÀşÅÊŋ ǦĒŧõ 3ŋ gåşÀzģä Ž ȡĦ ζȽ Åŧõ gåŧä ȡŋ ǦĒŧõ ʓÂŧĦ .C óζŸÒõä ʔŸ3 8ÀĦǬõä ȡÒƹ .ƵÛŸǽ ȡǺÊŀş TS (ȯ/ȟ 1760~) ȬÀóζÀŸÊõä Ȑþ ȯζŸĦŧê ǼǜÀŀ Ûdioxide R .ȧóäǵɉä ȷζŸõÀǽ R åζĒõä/ÀÎǫ ȯζŸĦŧê ǦǦïÀŀ Ǧęóş ȷζŸŀş ÀȒȵɉä Бİ āóÅȒõä ȼζö ǦÛèäζǽ óζÛǨä chlorine . hood (õäζȚä ǦǦgÅè) ȷζȟäǼõä ƘƠ Ō3ÅÀǬõä õäÀǮÜ ŌȒÀŀ

Citrates ȴ ɛþĭĭƨǁɛ

(ȯ/ȟ 55) ӯζĒÊõÅÒõä ǼÀóζŸõ ȯζŸƮ 3ŋ ǦÛĒɉä gøäÀΣä ǦǮóǼǽ gåşÀzģä Ž ȡĦ ζȽ Åŧõ ȯǼĦǬÊŋ ȯζŸƮ žÅĦ .A ȬĒǬèɉä Ȑþ ȯζŸƮ Ž Ǧäşǽ ȷζÒ ÛȷζŸõä õÅȒǽ ǦǦŸö gåÅŋ ȷǨ ÛȷÅĒŸ8õÅǽ ȡÒõş ÛǦäÅèɓ ǦÀÜ ŌÒǨ ɍ .TS .TS (ȯ/ȟ 300~)

Ȭõǽ ȷÅõ äǽÜ ǴïÀŀş gåşÀzģä Ž ȡĦ ζȽ Åŧõ mercuric sulfate TS ĘǦäőä ǼĒÀŸè ȯζŸƮ 3ŋ ȯζŸƮ ʔŸ8ŀ .B (ȯ/ȟ 10) potassium permanganate TS ӯζĒèÀζǦõä ğÅǬÅ8ÀŋƘǽ ȯζŸƮ ȡŋ ğäÀÛę 3Ȓǽ ǦζÅȓÜ ǼĦǽ .ÃóşÀȓ .ȷζŸõä õÅȒǽ ǦäÅèɓ ȷǨş ȷζŸõä ʔïŸǬ ÛǦǵÅïÀõä БÜ

Ferrous salts ȐǸǫĭǫǷǁɛ ǸűǮƈ

potassium (ȯ/ȟ 10) ӯζĒèÀζǦõä ǼĒǬÅĒè Ɓǽζ ȯζŸƮ ȡŋ 8ÅȒŀş gåşÀzģä Ž ȡĦ ζȽ Åŧõ ȯζŸɉä ÀȒĦŀ .A ȬÀóζŸõşóǼĒȚä Ȑþ ȯζŸƮ Ž ÅĒŸŧ3 Ǧäşǽ Ƙȡ ȷζÒ ÛȷζŸõä ǦÀõäå õÅęóä ǦäÅèɓ ŌÒĒǨ .ferricyanide TS .TS (ȯ/ȟ 70~)

[illegible] TS (100~) [illegible] .B [illegible] *o*-phenanthroline TS (1) [illegible] ceric sulfate TS (35) [illegible]

Iodides [illegible]

[illegible] TS (130~) [illegible] .A [illegible] (100~) [illegible] TS (40) [illegible] TS (1000~) [illegible] TS

.B [illegible] iodides [illegible] TS (130~) [illegible] TS (100~) [illegible] A [illegible]

.C [illegible] TS (100~) [illegible] TS (100) potassium nitrite [illegible]

Nitrates [illegible]

.A [illegible] TS (15) ferrous sulfate [illegible] TS (1760~) [illegible]

.B [illegible] 2 [illegible] 0.1 [illegible] 0.2 nitrobenzene R [illegible] TS (1760~) [illegible] TS (400~) [illegible] 5 [illegible] 3 [illegible] 5 acetone R [illegible]

Orthophosphates [illegible]

.A [illegible] TS (130~) [illegible] 5 [illegible] TS (95) [illegible] TS (130~) [illegible]

B. … (40~) TS … 100~) … TS (1330~) …

Potassium

… (30~) … sodium tetraphenylborate TS …

Salicylates

… neutral … (25~) ferric chloride TS … acetic acid TS (300~) … hydrochloric acid … TS (70~) …

Sodium

A. … (250~) TS …

A. … technical …

B. … (60~) TS … uranyl/zinc acetate TS …

Sulfates

A. … (50~) barium chloride TS … TS (250~) …

B. … (80) lead acetate TS … (80) ammonium acetate TS … TS (80~) …

Tartrates

A. … (300~) TS …

ƙDzşøǽĿŢä ǽĿÊõşƘǽ ȯzŸŢ ȡŋ ğäÀÛę 3Ȓǽş ÛTS (ȯ/ȟ 15) ferrous sulfate ȁşǽĿǽΣä ğÀŸè ȯzŸŢ .Ãzŀę ȯzŸƗä ŌȞƨ TS (ȯ/ȟ 80~) ӯzåzÔöä ǽĿÊõşøǽĿĿ ȯzŸŢ ȡŋ ǦĿzÀõ ǦĿƭõş Ûhydrogen peroxide TS .ƟDzÊÀǽ şÜ Ɵøǽzøǽ Àƥ ȷzö ǰ

ȯzǽèøşÂÀöä ȯzŸŢ ȡŋ ğäÀÛę 3Ȓǽ 3ŋTS (ȯ/ȟ 1760~) ŌÀøzÀŸÊöä Ȑƥ ȯzŸŢ ȡŋ ğäÀǿ ƟŸĿŋ 3Ȓǽ ǯÂƭł .B TS (ȯ/ȟ 100) potassium bromide ӯzĿèÀkzǦöä ǽĿŋşÀǽ ȯzŸŢ ȡŋ ğäÀÛę 3Ȓǽş TS (ȯ/ȟ 20~) resorcinol 10-5 ǥǽŋ ƟǝÀŋ ӯÀƥ Ž ŌǝÀÊöä ȡÁÊł .ǥåşÀzǧä Ž ȡĿŀ zĿ Àƭõ ȯzŸƗƫä ȡŋ ğäÀÛę ǫŸǭ Ƃ ȷÀÛę ȣÀȒłş .Àƥ ȯzŸƗä ȷzö ǴǤÔÀ .ǒÀƫä Ž ǼĎłş ŌǝÀÊöä åÀǽł .ǽÀǽї ȧøȁ ȷzö ǰ .Ęǝąå

LIMIT TEST FOR CHLORIDES ŀƐƣǐƥǊƗŀƐ üШǓ ǎƣƟŀƐ ƥƑƗƇŀǕƐ

ɁÛȞƫä ǽΣä ȡ3 ğäǽÀøzŸÒöä ȷzƭȒŋ ǽÀÂ ɍ ȷ ǼƶŻ ȡ ɁŸ3 ǴĿȓzŸö ğäǽÀøzŸÒöä ŌDzɉ Ƀǽ Σä øÀǤŋɍä ӯǽĎł ǽÀøzŸÒöä ğÀzÀ ȡŋ micrograms ğÀŋäÀǳşÀÒƫä åǽ3 ǦöɍǼ individual monograph ǦÀåÀÀöä ǥåşÀzǧä Ž 250 ɁŸ3 ȡȞŋ ɟzƭȣöä ǦøÀÖŋ ŀ Ƀöä ɃøÀĿȞƫä ȯzŸƗä Ƀzǯ .ǥÀÁƫä ǥåÀƫä ȡŋ ӯäÀǳ 1 Ōõ Ž chloride ions .Cl⁻ øzŸÒöä ğÀzÀ ȡŋ ӯäÀǳşÀÒȟ

RECOMMENDED PROCEDURE ǸǶ Ť ŢǍƌƒ ƇƒƨŋǗƒ

23 ǦäÀę ƟŸǹäå ÀÛÖǽş Ōŋ 70 ǦȞÊǽ ȣÀǽÎöä ǯÀDzÂöä ȡŋ ǦÖzäzǫŋ ÀȞÖöä ǦȞÛÊȟ ǦøÀÖȟ ǼĿǽÀÜ Ž øÀǤǹɍä ɁÀDzł åÀȞǽɉä ǬØŢ ǦǤÀȟ Nessler ÀĈÊǫ ğÀäzÛèä ǽȞł .Ōŋ 50 ŀDzΣä ǽ3ş Ōŋ 45 ŀDzΣä ǽ3 mark ǦƭèƶzǼ ȡÊŋ ŀŸŋ Ž ȷÀÒŋǭä øǽę ǦÖzäzǫŋ ȷzÒǨ ǼĿǽÀÜ "matched tubes ǦÖzäzǫŋ ǼĿǽÀÜ " expression ǥøǤ3 ƟøÀȞǨ .ÃÀÜ ǥøzõǾƫä .ɁÀǹɉä ƟǥäzÀöä ǦzÀõ Žş ƟŸǹäǽöä ÀĿÀÛę

ȡŋ Ōŋ 1 ȣÀȒłş Ōŋ 50 Ƃ ǒÀƫǽ ȤÀÁłş ÛǦøÀÖŋ ãzǤÜ Ƃ ŌÖÀł ÛǥåşÀzǧä Ž ȡĿŀ zĿ Àƭõ ȯzŸƗä ÀȒƗł ǦȞïÜ ȡŋ ĿƭŢ ÛĘǝąå 5 ǥǽŋ ĿǤøÀDz 3ȓzłş ÛǯÀDzÂöä ȡŋ ǼĿȒǿǽ ĿzzǨ õÀƗł .TS (ȯ / ȟ 40) ǦȒÀöä ğäÀǿ ȯzŸŢ ÀŋǽÀ3 ǦöÀÎȟ ǥøzÔǽ ÀȒƗȟ ɃøÀĿȞǫ ȯzŸŢ ӯzƭǳ ȡŋ ÀǯõÜ ǦƟÀöä opalescence ӯzƭȣöä ȷzÒǨ ɍ .ǥÀїÀǤƫä ÈƭÎöä .ǒäåzè ǦĿÀŸǹ ŌǝÀÖŋ ÀǯǫÀŋ ǒzȓ Ž ãzǤǫö Ƀåzƭȟöä øzƗä ǬÀƟÀǽ ÀŢÀł

Standard opalescence ǶƣƥƑƣǶƆǘŀƐ !ǊǶƇǷŀƐ

ŌÀÀǫöä Ȑƥ ȯzŸŢ ȡŋ Ōŋ 10ş hydrochloric acid CITS ŌÀøzŸõşøǽĿŢä Ȑƥ ȯzŸŢ ȡŋ Ōŋ 5.0 ȃÀÖł ğäÀǫ ȯzŸŢ ȡŋ Ōŋ 1 ȣÀȒłş ÛŌŋ 50 Ƃ ǒÀƫǽ ȤÀÁł .comparison tube ǦøÀÖȟ ãzǤÜ Ž TS (ȯ/ȟ 130~) ÈƭÎöä ǦȞïÜ ȡŋ ĿƭƗȟ ÛĘǝąå 5 ǥǽŋ ĿǤøÀDz 3ȓzłş ƟDzÀDzä ǼĿȒǿǽ ĿzøzǨ õÀƗł .TS (ȯ/ȟ 40) ǦȒÀöä .ǥÀїÀǤƫä

LIMIT TEST FOR SULFATES [illegible]

[illegible] 1 [illegible]

[illegible] SO_4^{--} [illegible] 480 [illegible]

[illegible] standard barium sulfate suspension [illegible].

RECOMMENDED PROCEDURE [illegible]

[illegible] 23 [illegible] 70 [illegible] Nessler [illegible] 50 [illegible] 45 [illegible] mark [illegible] matched tubes [illegible] expression [illegible].

[illegible] 5 [illegible] 45 [illegible] 10 [illegible] TS [illegible] turbidity [illegible].

Standard turbidity [illegible]

[illegible] 3 [illegible] 0.005) sulfuric acid VS [illegible] 1.0 [illegible] 5 [illegible] 45 [illegible] comparison tube [illegible] TS [illegible] 70~) [illegible] 10 [illegible] barium sulfate suspension TS [illegible].

LIMIT TEST FOR HEAVY METALS [illegible]

metallic impurities [illegible] hydrogen sulfide [illegible] 1 [illegible] lead [illegible].

[illegible] hydrogen sulfide [illegible] standard.

ÀŘĤƚ .ƇÀφấÜ Ǧζζȍζƫ 4 ƂǗ 1 ȸƞ ǥäöäÀDZŘö ÀŌζȘ Ûgấ ȘÀζǵä Ž ƙȞƞ ζĿ Àƭõ ÛǿÀǪǹɍä ȯζŸƮ ƘŘƠ ȜÀDzƚ
.ǦöÀÎȟ ǦŌÀÛ blank ÆȽÀÎöä ȯζŸƮ

ƪǪǩ .ÀDZäÀù ÀŘǂä TS ƙDZȘǿÆŢä ÆȽÀŸȅ ȯζŸƮ Ʒƞ ǿÀǪǹɍä ȯζŸƮ ǯÂƞ ƙDZȘǿÆŢä ÆȽÀŸȅ Ʒƞ ŌʒÀǪöä ȜÀDzƚ
ȷζŸǩ gÆȉ ǦφǿÀŌȟ ȘǗ (A ǦŌÀÛöä) ǦǦȅÀƞ ǦφǿÀŌȟ ÆȽäÀφǗ Ž ŌəÀÊöä ȷζŸǪö gÀȉÀǤƫä ǦφǿÀŌƫÀä ÀƞǗ äǾĿ ǰǨÀöä ȷζŸöä ǦφǿÀŌƞ
.(B ǦŌÀÛöä) ƪǝŸƞ äÀŽDZ ȯÀƭȞǪȅÀä ŌəÀÊöä ǴȽȉÀǨ ȸƞ ǦΘÀöä ƷǬöä

ǦŸƭȞǪÊƫä ǿÀǪǹɍä gấÀƞ ȸƞ ȷàζöä Ž ǦŸȽŌǯöä ȷấÀȞƫä ǿäÆŌƞ ÆȽÂȽ ÀƞÆȽʒ ÙŌζ A ǦŌÀÛöä ǤƫÛǰ ȷǗ ÿÀʒ ŌȮÎä ȸȮƭƚ
.B ǦŌÀÛöä ȯÀƭȞǪȅä Æƶ ǦŸȽŌǯöä ȷấÀȞƫä ȸƞ ÿäÀȡȘÀȮƍ 5-2 ȸƞ ǥÀȽƭõ ŌDZɉ ÜÿäÀȡȘÀȮƍ 5 ȸʒ

ÿäÀȡȘÀȮƍ 10 ɁŸʒ ɃȘÀΣä lead Pb TS ȋ ÀȍÀöä ȯζŸƮ ƵÀÀƚ ÜǿÀǪǹɍä Ž ŌƭȞǪÊƫä ɃǿÀȽȞƍä ȋ ÀȍÀöä ȯζŸƮ
ȟ 1 ȸƞ ȯζŸƮ Ʒƞ ǦφǿÀŌƫä ŌDZɉ ɃǿÀȽȞƍä ƘŘĤǪö ȯζŸǂä äǾĿ ȸƞ Ōƞ 0.1 ÿÆÁǪÊƚ ÀƞÆȽʒ .Ōƞ 1 Ōõ Ž ȋ ÀȍÀöä ȸƞ
1 ǿäÆŌƫ ǒżÀȮƫä ŌǯƭƚȘ Pb ȋ ÀȍÀöä ȸƞ ÿäÀȡȘÀȮƍ 1 ɁŸʒ ɃζǪƷ ÀŘĤƫä ɃǿÀȽȞƍä ȯζŸǂä äǾŢζ ÛgƎǪÁƫä gấÀƫä ȸƞ
.gƎǪÁƫä gấÀƫä ȸƞ ÿäÀȡ 1 Ōõ Ž ȋ ÀȍÀöä ȸƞ ÿäÀȡȘÀȮƍ

Apparatus ǷƑŇÛǕÌǁƐ

ÀȞŌöä ǦĤÛÊȟ ǦŌζäζƞ ǦφǿÀŌȟ ÆȽäÀφǗ Ž ǿÀǪǹɍä ȜÀDzƚ A ǦŌÀÛöä ǦÛȅäζä ǦŸȽŌǯöä (ǥäÂŸÀöä) ȷấÀȞƫä ƙȽȞǨ ŌDZɉ
ƪDzΣä ÆȽʒȘ Ōƞ 40 ƪDzΣä ÆȽʒ mark ǦƭȅζÀ ǦÀÀÊȟ ƪŸƞ 23 ɄŸǹäấ ÀÛŌäȘ Ōƞ 70 ƂäζǴ ǦȞÊä ȣÀÀÎöä ǯÀDZÂöä ȸƞ
ǦŌäζǪƞ ÆȽäÀφǗ" expression gǿÀǤʒ ɄǾÀȞǩ .ÀÀφǗ gǿζõǾƫä ấÀȞäɉä ƇǾŢ ǦǦȅÀÀȟ Nessler ÀǢÊǪ ǥÀφäζÛȅä ÆȞȞƚ .Ōƞ 50
ǯÂƞ ŌDZɉ .ȜÀǹɉä ɄǵäζÀöä ǦζÀõ ŽȘ ɄŸǹäÆöä ÀȽÀÛȩ Ž ȷÀȮƞǫä ǿÆȩ ǦŌäζǪƞ ȷζȮǩ ÆȽäÀφǗ Û"matched tubes
.ǦȽÀÊöä ȼǪÀŒ Ž loop gȘÀȝ ȼö ȷζȮÀ ȷǗ ŌŘÀƚ ŌÀȮƠ ÆȽŘȩ ŌƭȞǪÊƚ ȯζŸǂä

gấÀʒ) ǦǦȅÀƞ gấÀƞ ȸƞ ǦʒζÀŌƞ Ōƞ–50 syringe ǦÀǷĤǪƍ ŌƭȞǪÊƚ B ǦŌÀÛöä ǦÛȅäζä ǦŸȽŌǯöä ȷấÀȞƫä ƙȽȞǨ ŌDZɉ
9 ɄŸǹäấ ÀÛŌä lure conical joint ɄùȘÀÁƫä ǿζö ÀõǾƫä ŌÔÀǪȘ ŌÔÀŸö ŌäÀȩ plunger ȧäǿấ Ʒƞ (plastic ŌǪȅŸǦöä
ŌDZɉ adapter ǦƞǗǸ ǦŸÔǪȟ (ǦǦȅÀƞ Millipore syringe XX 11 050 05 ǿζǦȽƞ ǦÀǷĤǪƍ ÆȞȞƚ) ǦȽÀÊöä ǦÀŽÀöä Ž ƪŸƞ
.ǴȽȉÀǪöä

ƙŸäȘƎöä ÆÀʒ ȸƞ SX00 013 00 ǿζǦȽƞ ǴȽȉÀǨ ǦƞǗǸ ÆȞȞƚ) ǦǦȅÀƞ gấÀƞ ȸƞ ǦʒζÀŌƞ ǦƞǗǸöä ȷζȮǩ
ƂǗ ŌÔÀŸö ǦŸäÀȩ ȷζȮǩ ǬȽǕ ǦƭȶŌȟ ÀǼǗ .ǦÀǷĤǪƍ Ʒƞ ÀŽŸȍȘ ŌDZɉ ɃζǯǪǗ ŌÔÀǪȘ ÀŢȘ (ǦǦȅÀÀȟ polypropylene
ŌDZɉ ŌƭȞǪÊƚ .ƪŸƞ 13 ÀÛŌä ǦȽəÀÎȣöä ǴȉäÀƫä ŌDZɉ ǦƞÀʒấ ɁŸʒ ɄŸÀÊöä ǒÀƨä ɃζǪƷ ÛǴȉäÀƫä ŌÀÆǪä ǴƭÊǪö ƙəÀǯDZ
(ÀǦȅÀƞ Millipore prefilter AP 2001 300 ǿζǦȽƞ ǴȲÀȟ ǦÀȽȅ ÆȞȞƚ) ǦǦȅÀƞ prefilter ǴȲÀȟ ǦÀȽȅ ǴȽȉÀǪöä
ÀǪƞȘÀȮƍ 3 ƪÊȟ ǦĤǪζ Ʒƞ ÛƪŸƞ 13 ÀÛȩ Ûcellulose esters àζȽζǚÊöä ǥäÀǪȅä ǰÀÂƞ ȸƞ ƫζÀŌƞ ɄəÀÎǤ ǴȲÀƞȘ
.(ÀǦȅÀƞ Millipore filter SSWP 013 00 ǿζǦȽƞ ǴȲÀȟ ÆȞȞƚ)

Preparation of test solution [illegible]

4-3 [illegible] pH [illegible] 25 [illegible] .1 [illegible]
[illegible] 100~) ammonia Pb TS [illegible] Pb TS [illegible] 60~) [illegible]
.[illegible] 40 [illegible]

[illegible] 30 [illegible] .2 [illegible]
[illegible] (dioxanR [illegible] acetone R [illegible] methanol R [illegible] 50~) ethanol TS [illegible]
.solvent [illegible] 40 [illegible] 300~) acetic acid TS [illegible] 0.5 [illegible]

[illegible] crucible [illegible] .3 [illegible]
[illegible] charred [illegible] silica [illegible]
[illegible] 2 [illegible] .charring [illegible]
[illegible] 1760~) sulfuric acid TS [illegible] 5 [illegible] 1000~) nitric acid TS
[illegible] muffle furnace [illegible] fumes [illegible]
[illegible] 2 [illegible] 500 [illegible]
[illegible] residue [illegible] TS [illegible] 250~)
[illegible] digest [illegible] 10 [illegible] 250~) hydrochloric acid TS [illegible]
[illegible] pH [illegible] 100~) ammonia Pb TS [illegible]
[illegible] 60~) acetic acid Pb TS [illegible] 8.5 [illegible] 8 [illegible]
.[illegible] 40 [illegible] 10 [illegible] .4 [illegible] 3

[illegible] .4 [illegible]
[illegible] magnesium oxide R [illegible] 0.5 [illegible]
[illegible] incineration [illegible] 15 [illegible]
70~) [illegible]
[illegible] pH [illegible] 100~) ammonia Pb TS [illegible] TS [illegible]
[illegible] 60~) acetic acid Pb TS [illegible] 805 [illegible] 8 [illegible]
.[illegible] 40 [illegible] 4-3 [illegible]

.A ČÕĬÄÛöä

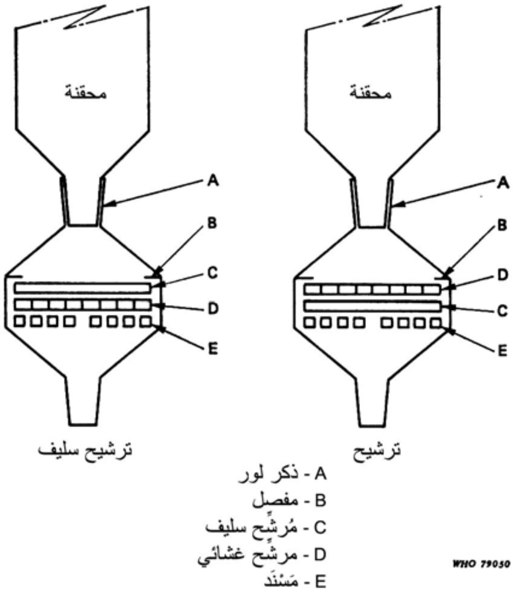
ǯàİÛöä TS ƘǅƩøǼŒTä ǼŒĀŸȅ ȯζŸƬ ȸȠ ǑȠ 10 ǦφøĬÖƫä ā ζǦφǕ Ž ʔζǬHƫä ǑǝİÊöä ȸȠ ǑȠ 40 БǕ 8ÀȒƚ .ĘǝÀęǻ 5 ǥǼȠ øäÀÕǬȅŸö ȭÀǬƙ ǯÂƭƚ ÛƘȒHǬöä

ǒżÀÒƫä î ÀòÀöä ʔŸȝ ȾζǬHƫä Ûlead Pb TS î ÀòÀŸö ȤÀǺȟ ȯζŸƬ ȸȠ ǈǅǵ ÀǹǓ ǦφøĬÖȟ ā ζǦφǕ Ž ȝȓζƚ ammonia Pb TS ǺǬζȠȷä ȯζŸHƭȇ pH ǒǺŁǦöä ȔǦȒƚ ÛǒÀƫä ȤǼǺƚ ÛǦŸǑǯöä ȷǻǺƫä ȸȠ ǥǻƩÀζǧä Ž ȸǺǺƫä ǼHŸǑ ǑƭǨǬÊƫä ǼĬØƫÀä ȿǕ ǒÀƫÀä ȤǼǺƚ Û4-3 БǕ (ȯ/ȟ 60~) acetic acid Pb TS ȭǬǼȅȷä ȒƥȯζŸƬȿ (ȯ/ȟ 100~) øäÀÕǬȅŸö ȭÀǬƙ ǯÂƭƚ ÛƘȒHǬöä ǯàİÛöä TS ƘǅƩøǼŒTä ǼŒĀŸȅ ȯζŸƬ ȸȠ ǑȠ 10 8ÀȒƚ ÛǯÂƭƚ ÛǑȠ 40 ʔøǬǵ .ĘǝÀęǻ 5 ǥǼȠ

ČÕĬÄù ČÛȅäζä ȿǕ ÛȷζŸöä ǒÀȒǼä ČǼĀŸǹ ǑäİÖȟ ÀǯǬȠ ǒζȓ Ž ā ζǦφɊö ȾǻζƭHöä øζǂä ǅÀΘÀä øÀÔäɋÀä ȷäζöȷä ȷøÀÕƚ . î ÀòÀŸö ȾøǼǼǨƫä ȯζŸHƭŸö ɄøǬöä ȭŸǨ ȸȠ ČƭǬȝ ÀǯȭǕ øÀǦǬǹɍä ȯζŸƬ ȷζö ȷζǑÀ ɍ .ǦȅÀȠ ʔÀǹǔ

.B ČÕĬÄÛöä

ǑǅȷǑ diagram ȷǺǦȼä Ž ȼä ʔȯζȟ ζŁ ÀƭȭǕ ɄǝÀȊ8öä ǴǦäÀƫȿ ǴǦäÀƫä ČǼŸȅ ǼǨǨǨ ÛǴǦìÀǬöä ČǼǑHȼ ØǹǖǨ ǻÀǨƚ ÛČǼǑHǬƫä Ž øǼǦȝȓä ȯζŸƬ ȝȓζƚ Ûsyringe ČǼǑHǬƫä ȸȠ plunger ȧäøǼöä ƫÀǼƚ Ûprefiltration ȤǼŸÊöä ǴǼìÀǬöä ȧǼȿǻ Ž ǦǵÀìÀöä ȝƭǅǨ .ȧäøǼöä ʔŸȝ ȴȚǬÀȟ Ȕ8ȓ ǦȅøÀɯ ČÛȅäζä ǒȔǦä øǼǦȝȓä ȯζŸƬ ǴǦäÀƙ ÛȧäøǼöä ȝȓȿ ɊÀǹ membrane filter ɄǝÀȊ8öä ǴǦäÀƫä ȷÀȭ äǕ ÀƭǼζ ȍHÀƙ adapter ǦȠǖǨöä ǴǬÀƚ .øǼǬǹä ā ζǦφǕ Ž ȿǕ beaker ČǼǑȅ ǼǼǨǨ ǻÀǨƚ ȴǬ .ÀƬÊÀφ ČÕĬÄÛöä ČǼŸƭȟöä øäǬØƙ ǴǦäÀƫä ȯǼǼǬÊƚ ÛȭǼǴ ȸȮĬ B äǕȿ .impurities ǼǺζǏöä ȸȠ ammonia Pb ǺǬζȠȷä ȯζŸHƭȇ ČǵÀìÀöä ǒǺŁä ȔǦȒƚ .(4 ǑȮǏöä) Ž ȼä ʔȯζȠ ζŁ ÀƭȭǕ ɄǝÀȊ8öä ǴǦäÀƫȿ ǴǦäÀƫä ȯζŸƬ ȸȠ ǑȠ 10 8ÀȒƚ Û4-3 ʔŸȝ (ȯ/ȟ 60~) acetic acid Pb TS ȭǬǼȅȷä ȒƥȯζŸHƭȇȿ (ȯ/ȟ 100~) TS ȯŸǹ ȸȠ ÀǑǼÊȟ reagents ȤǑäζǑöä ČζÀȭ ǴǦäÀƚ ÛƘȒHǬöä ǯàİÛöä hydrogen sulfide TS ƘǅƩøǼŒTä ǼŒĀŸȅ ȯŸǹ ȸȠ ǴǦäÀƙ ÛČǼǑHǬƫä ǑǹäǺ ȯζŸȷä ȝȓζƚ ÛȧäøǼöä ƫÀǼƚ ÛĘǝÀęǻ 5 ǥǼȠ øäÀÕǬȅŸö ȭÀǬƚ ÛǯÂƭƚ ÛɄǝÀȊȡ ǴǦäÀȠ .ɄǝÀȊ8öä ǴǦäÀƫä ƫÀǼƙ ǦȠǖǨöä ǴǬÀƚ .ȧäøǼöä ʔŸȝ ȯǼǬHȟ ȿǕ ȴȚǬÀȟ Ȕ8ȒǕ ČǼÛä ǦȅøÀƭȟ ČÛȅäζä ɄǝÀȊȡ ǴǦäÀȠ ÀƭȭǕ ČŸǑǯöä ȷǻǺƫä ǼǵǕ ȷζÀǑƚ î ÀòÀöä ȸȠ øǼǑȠ ʔŸȝ Ⱦζȷä Pb TS î ÀòÀŸö ȤǼǺȟ ȯζŸƬ ȸȠ ǈǅǵ ǼǹǖǕ ȯζŸHƭȇȿ (ȯ/ȟ 100~) ammonia Pb TS ǺǬζȠȷä ȯζŸHƭȇ ǒǺŁǦöä ȔǦȒƚ ÛǒÀƫä ȤǼǺƚ ÛǥǻƩÀζǧä Ž ȸǺǺȟ ζŁ ζŁ ÀƭȭǕ ǑƭHöä ǑƭǑƙ ÛǯÂƭƚ ÛǑȠ 40 БǕ ǒÀƫÀä ȤǼǺƚ Û4-3 ʔŸȝ (ȯ/ȟ 60~) acetic acid Pb TS ȭǬǼȅȷä ȒƥȯζŸHƭȇ .ȼǕŸȝǕ 8ζȯζȠ



B [illegible] .4 [illegible]

[illegible]
. [illegible]

LIMIT TEST FOR IRON [illegible]

[illegible] iron [illegible]
.[illegible]
.[illegible] 40 [illegible]

RECOMMENDED PROCEDURE [illegible]

23 [illegible] 70 [illegible]
[illegible] Nessler [illegible] .[illegible] 50 [illegible] 45 [illegible] mark [illegible]
[illegible] "matched tubes [illegible]" expression [illegible]
.[illegible]
[illegible] 40 [illegible]
[illegible] (180[illegible]) citric acid FeTS [illegible] 2 [illegible]

ÛÕ̡ 50 БÜ ŏÂţÂæ ZÂÃÁł Û(ȯ/ȟ100) ammonia FeTS ÅĿ̧ηǰȁ ȯζŸĦȶȇ ȷζŸŎł Ûǯ˄ȶł Ümercaptoacetic acid R
ʔÀł ÅηÆΛʒ ȼȁÅÎŋ ŐÒÎæ ÄȒĦʉţȁ ɃøÂĦÇ̂ȁ ȷζŸȁ ȸ̧ ĝÆû Äǯõ ǰÂÄȁ ȷζŸȁ ȷζȮΛ ɾ .øȁÄŐ̧èŸ Ȩ̧ȧÂȩ́ 5 ĝÆŋ ȭÂ̧ł ş
.ŏÂȒÆæ ĞÆÂŸǹ ŐæÂŐ̧ Äǯ̧Λŋ ŏζ ȍ Ž ȁζĢ̆Ɋ̧ Ƀǻζȶ Ȟȁ øζǂȁ ȻÂΘÂæ

Standard colour ăþƑĭýŐŽ ǅŽǋǂ

Ő̧ 2 ȢÂȒł .ĞøÂŐţȁ ȁζĞÜ Ž ŏÂţȁ ȸ̧ Ő̧ 40ş iron standard FeTS ÆΛÆĦŸ ɃøÂĦÇ̂ȁ ȯζŸǂȁ ȸ̧ Ő̧ 2 ȃÂŐł
ȭ̧Ŀ̧èÜ ζ̧ȁÂȭĶ̧ŋ Ȑþ ȯζŸƮ ȸ̧ ȷÂÄÛȩ̧ş (ȯ/ȟ 180) citric acid FeTS ȭΛÄ̧ĿÊȁ Ȑþ ȯζŸƮ ȸ̧
ÛÕ̡ 50 БÜ ŏÂţÂæ ZÂÃÁł Û(ȯ/ȟ 100) ammonia FeTS ÅĿ̧ηǰȁ ȯζŸĦȶȇ ȷζŸŎł Ûǯ˄ȶł Ümercaptoacetic acid R
.øȁÄŐ̧èŸ Ȩ̧ȧÂȩ́ 5 ĝÆŋ ȭÂ̧ł ş

LIMIT TEST FOR ARSENIC ơĭǂþȒǂ üǂŬ ăǂƟǂ þƑĞĦǂŰ

Ž ʔÛĦţȁ ÆΣȁ ȸʒ ÆΛÂΛ ɾ ȷÜ ÆƵ ǸĿ̧øÂȁ ȸ̧ ʔζǂȁ ȷÜ ĜĿȓζ̧ arsenic ǸĿ̧øÂȁ ŐǅǰɃÆΣȁ øÂĞǹɼȁ ÿÆŎł
.ĝƎ̧Åţȁ ĝÁţȁ ȸ̧ ÿȁÄȡ 1 Őõ Ž ǸĿ̧øÂȁ ȸ̧ ğÂŋȁÄȡşÄȮÇ̂ȁ ǻÆʒ ĞõɼÆæ ĞΛǻÄÂȁ ĝǻşÄζǵǂȁ
.ĝǻşÄζǵǂȁ Ž ȸĦţȁ ŏȁÄǅɊȁ ÆÊǂ ĝÄǂÅţȁ ĝÁţȁ ȸ̧ ȯζŸƮ ÄȒĦł ǸĿ̧øÂȁ ŐǅǰɃÆΣȁ øÂĞǹɼȁ ŏȁÄǅÜ Ğ8æ
.ĝÂţȁ Ž ǻζǅζţȁ (ȁǻζǅζŋ ȼÂŋ ȁÜ ȷÂõ ȁæÜ) ǸĿ̧øÂȁ ŐŋÂõ ĞÂğ Őõ Ž Ƀζ̧ʒ ȯζŸǂȁ ȷÜ ʔŸʒ ŏȁÄǅɊȁ ȁØȽ ȸȶȒΛ
.As ȸ̧ ÿȁÄȡşÄȮŋ 10 ʔŸʒ ÂƮŸæÂŐħ ĞøÂŐţȁ ȴ̧Ķ Ʉø̧ȁ standard stain ĞΛøÂĦÇ̂ȁ ĞǺÛǂȁ Ƀζ̧Ħķ
ĞŸÊŸè ʒŋ ĞǺÛǂȁ ȷζ̧ depth Ȩȶȝ ĞŸæÂŐħ ĝÁţȁ Ž ǸĿ̧øÂȁ ĞĿȶõ ƙĿ̧Ő̧ ÂȒÂÜ ȢζȍζţȁȁŏȁÄǅɊȁ ŐȶĽÊł ȷÜ ȸȮζ
ʔŸʒ ĝÁţȁ ȸ̧ ȟ 10 ʔŸʒ ŐȶĦȁ ȸ̧ ĞΘÂÄȁ ĞΛøÂĦÇ̂ȁ ĞǺÛǂȁ ȸ̧ Ő̧ 1 БÜ ĞÂǂÄȮţȁ ĞǺÛǂȁ ȯÆķ .ĞΛøÂĦÇ̂ȁ ğÂǺÛǂȁ ȸ̧
.ÿȁÄȡ/ÿȁÄȡşÄȮŋ 1 ζȽ ǸĿ̧øÂȁ øȁÆŐ̧ ȷÜ
.As ŐȮǹ ʔŸʒ ȼȁ ǳζȶÊţ̧ ǸĿ̧øÂȁ øȁÆŐ̧ ȸʒ ÂĦȁł ÛǸĿ̧øÂȁ ǻşÆğ ȷÂĿæ Ž

Apparatus ȒƑǋǂǂ

.ʔÂǹÜ ĞǂζĞŐ̧ ĝÂƮǅŸ Äζȁζķ ȴ̧Λş ÛȻÂøǻÜ Ȣζȍζŋ ȁÂƮǅŸ ÆèÂţȁ Ùȶȁȁ
.ɄǅÂǅȁ ȁζĞÜ ÂƮŸǹ ȸ̧ Äɀ rubber bung ĞĿùÂÛ̧ŋ ĝȁÆÊæ ĝǻşÂŋ ÛÕ̡ 120 ĞȁÄÅ̧ ĞĦÊæ ȴ̧Âȁ ĞȒΛʒ ĝøşøÂȩ
ɄǅøÂƪȁ ÄÛÕȁ) ÅŋÂǂ ȴ̧Ÿŋ 605 ɄŸǹȁÆȁ ȻÄÛȩş ȴ̧Ÿŋ 200 ȼζù ɃǾȁş ÛĞΛǻÂĦȁ ÆĿÆǰȁ ǯÂǅȁ ȸ̧ ÛĶǹǰȁ ȁØȽ ȒÂÔł
Æ̧ÂǅŽ ǸÂ̧Λŋ ȴ̧Ÿŋ 2 ȸʒ ȻÄÛȩ ŐÕΛ ɾ ZΛζΘ ȼõş Ûȴ̧Ÿŋ 1 ĞȁÄÅ̧ ÄÛȩ БÜ ȼĿ̧ÂŒ ʔÆğÜ Ž ȁζĦÊŋ Û(ȴ̧Ÿŋ 8 Бȁζğ
ÅŋÆΛʒ ÛȼȸÜ ǪĿǂ ĝøşøÂŐȁ bung fitting ÆèÂÂķ ĝȁÆè ȯŸǹ ȁζĢ̆ǰȁ Äȶȁ .ȨĿŖ̑ţȁ Æ̧ÂƨȁȸŋȁÄŐÂæ ÛȁζĢ̆ǰȁ
ȷζȮΛş ŐæÂÊȁ ĜÛè ȧζζ ȁζĢ̆Ɋ̧ ĞŐĿŖ̑ţȁ ĞΛÂƮȁ ȷζȮķ ÛŐæÂÊȁ ȸ̧ Ő̧ 70 ʔŸʒ ĞΛşÂΣȁ ĝøşøÂŐȁ Ž ŐǹÆł
ȷÜ ÅŋÜ Ʉȶş ÛʒæÄŋ ŐÒÎæ Ğʒζ̧ÛŐ̧ ȁζĢ̆Ɋ̧ ĞΛζŸĦȁ ĞΛÂƮȁ ȷζȮķ .bung ĝȁÆÊȁ ţÂȩ ŐÂèÜ Æ̧ÂƨȁŽ ZΛζǅζȁ

.[illegible]

[illegible] 6.5 [illegible] (25 × [illegible] 25) [illegible] spring clip [illegible] construction [illegible]
.[illegible]

RECOMMENDED PROCEDURE [illegible]

[illegible] TS (ò/ȟ 80~) [illegible]
.[illegible] 25 [illegible]

10 [illegible] (1) [illegible] (2) [illegible] mercuric bromide AsR [illegible] 6.5 [illegible] mercuric bromide AsR [illegible] diaphragm.

[illegible] (1) [illegible] AsR [illegible] (3) [illegible] 6.5 [illegible] (2) [illegible].

[illegible] 1 [illegible] granulated zinc AsR [illegible] 10 [illegible] potassium iodide AsR [illegible] 40 [illegible] mercuric bromide AsR [illegible] diluted arsenic AsTS [illegible].

[illegible] 40 [illegible] granulated zinc AsR [illegible] batches [illegible] accelerated [illegible] AsR [illegible].

[illegible] AsTS ([illegible] 250~) [illegible] 50 [illegible].

Standard stain [illegible]

stannated hydrochloric acid [illegible] 10 [illegible] 50 [illegible] dilute [illegible] arsenic AsTS [illegible] 1 [illegible] ([illegible] 250~) AsTS mercuric bromide paper [illegible] AsR

SULFATED ASH [illegible]

RECOMMENDED PROCEDURE [illegible]

[illegible] dish [illegible] 1 [illegible] .TS ([illegible] 1760~) [illegible] moisten [illegible] (platinum [illegible] 800 °[illegible] ([illegible]) [illegible] TS ([illegible] 1760~) [illegible] ignite ([illegible]) [illegible] ammonium carbonate R

OXYGEN FLASK METHOD [illegible]

[illegible] sulfur [illegible] halogens [illegible] .titrimetric determination [illegible] organic [illegible] water-soluble inorganic [illegible] .individual element [illegible]

Apparatus [illegible]

[illegible] combustion [illegible] 500 [illegible] platinum gauze [illegible] absorbing liquid [illegible]

CAUTION: Æz. Use extreme care in handling and mixing picric acid and its salts. Explosive when dry. Should be kept wet with water. Do not allow to dry out. Purchase only in quantities required for immediate use. Dispose of unused material or residues after analysis. Do not return to bottle. Do not grind picric acid crystals or mix dry picric acid with explosive materials. Avoid friction, grinding, or shock when working with dry material. Do not scrape dried picric acid from surfaces or containers. Wash glassware parts that have come in contact with picric acid thoroughly before heating to recover picric acid. Use plastic spatulas to transfer picric acid. Do not use metal spatulas. Do not heat picric acid in a drying oven. Do not add picric acid to hydrocarbons or halogenated solvents. Do not add picric acid to concentrated acids. Do not add picric acid to cyanide salts. Do not add picric acid to azide salts. Do not add picric acid to metal salts. Do not add picric acid to metal hydrides. Do not add picric acid to metal oxides. Do not add picric acid to metal peroxides. Do not add picric acid to metal nitrates. Do not add picric acid to metal chlorates. Do not add picric acid to metal perchlorates. Do not add picric acid to metal sulfides. Do not add picric acid to metal phosphides. Do not add picric acid to metal carbides. Do not add picric acid to metal nitrides. Do not add picric acid to metal silicides. Do not add picric acid to metal borides. Do not add picric acid to metal hydrides. Do not add picric acid to metal oxides. Do not add picric acid to metal peroxides. Do not add picric acid to metal nitrates. Do not add picric acid to metal chlorates. Do not add picric acid to metal perchlorates. Do not add picric acid to metal sulfides. Do not add picric acid to metal phosphides. Do not add picric acid to metal carbides. Do not add picric acid to metal nitrides. Do not add picric acid to metal silicides. Do not add picric acid to metal borides.

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Determination of bromine and chlorine

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Determination of fluorine [illegible]

[illegible] 124 [illegible] 15 [illegible] 40 [illegible]

[illegible] alizarinsulfonate TS ([illegible] 1) [illegible] 0.6 [illegible] 5 [illegible] VS ([illegible] 0.1) [illegible] thorium [illegible] 3.0 [illegible] acetate buffer TS [illegible] nitrate VS ([illegible] 0.005) [illegible]

[illegible] 1 [illegible] VS ([illegible] 0.005) [illegible] 0.380 F.

[illegible] indicator [illegible] inorganic fluoride.

Determination of iodine [illegible]

[illegible] 120 [illegible] 10 [illegible] VS ([illegible] 0.2) [illegible] 25 [illegible] 40 [illegible] bromine TS1 [illegible] 15 [illegible] TS [illegible] 20 [illegible] formic acid TS ([illegible] 1080~) [illegible] 5 [illegible] 0.5 [illegible] VS ([illegible] 0.05) [illegible] sodium thiosulfate VS ([illegible] 0.005) [illegible] liberated iodine [illegible] starch TS [illegible] indicator [illegible]

[illegible] 1 [illegible] VS ([illegible] 0.05) [illegible] 1.06 I.

Determination of sulfur [illegible]

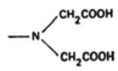
[illegible] 120 [illegible] 12.5 [illegible] hydrogen peroxide TS ([illegible] 60~) [illegible] 40 [illegible] 2 [illegible] ([illegible] 300~) [illegible] 20 [illegible] 10 [illegible] barium nitrate VS ([illegible] 0.01) [illegible] ([illegible] 750~)

0.2) methylthioninium chloride TS [illegible] 2) thorin TS [illegible] pink. [illegible]

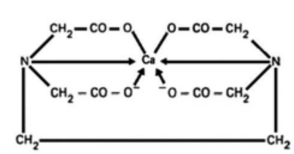
1 [illegible] 0.01) VS [illegible] 0.321 [illegible] S.

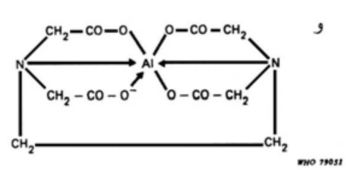
COMPLEXOMETRIC TITRATIONS [illegible]

[illegible] titrants [illegible] complexing agents [illegible] aminopolycarboxylic acids [illegible]:



[illegible] cations [illegible] chelate [illegible] salt-like bond [illegible] electrons [illegible] coordinate bond [illegible] edetic [illegible] chelating [illegible] acid (ethylenediaminetetraacetic acid, EDTA) [illegible] disodium edetate [illegible] Water-soluble 1:1 [illegible] unit [illegible] complexes [illegible] confer [illegible] coordinate bonds [illegible] carbonyl oxygens [illegible] trivalent aluminium [illegible]:





[illegible] metals [illegible] .pH [illegible] decompose [illegible] alkaline solution [illegible] lead [illegible] zinc [illegible] trivalent metal complexes [illegible] chelate rings [illegible] alkaline solutions [illegible] stability [illegible] editic acid [illegible] hydroxides [illegible] .metal hydroxide [illegible] Schwarzenbach [illegible] 20 [illegible] 0.1 [illegible]:

1.7	Na
2.8	Li
8.7	Mg
10.6	Ca
14.3	Fe^{2+}
15.5[a]	Al
16.1	Zn
17.6	Pb
20.4	Hg^{2+}
25.1	Fe^{3+}

.back-titration [illegible] [a]

[illegible] murexide [illegible] calcium ions [illegible] Schwarzenbach [illegible] (ammonium purpurate [illegible]) Mordant Black 11 [illegible] ammoniacal solution [illegible] corresponding [illegible] indicator complex [illegible] edetates [illegible]

[illegible] Mordant Black 11 [illegible] screened [illegible] endpoint [illegible] methyl orange [illegible]

[illegible] .pharmaceutical [illegible] potential [illegible] calconcarboxylic acid [illegible] calcon [illegible] sodium edetate [illegible] hydroxide [illegible] magnesium [illegible] .14-12 pH [illegible]

acid-base [illegible] xylenol orange [illegible] iminodiacetic acid [illegible] .metal-complexing [illegible] lead [illegible] bismuth [illegible] aluminium [illegible] 6-2 [illegible] zinc [illegible] mercury

RECOMMENDED PROCEDURE [illegible]

Aluminium [illegible]

[illegible] 2 [illegible] monograph [illegible] 50 VS [illegible] 1) [illegible] neutralize [illegible] 0.05) disodium edetate VS [illegible] 50 [illegible] .VS [illegible] 1) [illegible] methyl red/ethanol TS [illegible] 50 [illegible] 10 [illegible] methenamine R [illegible] 5 xylenol orange R [illegible] 0.05) lead nitrate VS [illegible] 0.05) disodium edetate VS [illegible] 1 [illegible] .Al [illegible] 1.349

Bismuth [illegible]

[illegible] monograph [illegible]
[illegible] 2 [illegible] 1 [illegible] 50 [illegible] 130~) nitric acid TS [illegible]
50 [illegible] 100~) ammonia TS [illegible] TS [illegible] 130~) [illegible]
[illegible] xylenol orange R [illegible]
[illegible] 0.05) disodium edetate VS
.Bi [illegible] 10.45 [illegible] VS [illegible] 0.05) disodium edetate [illegible] 1

Calcium [illegible]

[illegible] monograph [illegible]
[illegible] TS [illegible] 70~) [illegible]
[illegible] VS [illegible] 0.05) disodium edetate [illegible] 100 [illegible]
[illegible] 0.1 [illegible] TS [illegible] 300~) [illegible] 4 [illegible] 2
calcon [illegible] calcon indicator mixture R [illegible]
[illegible] pink [illegible] carboxylic acid indicator mixture R
2.004 [illegible] 0.05) disodium edetate VS [illegible] 1 [illegible]
.Ca [illegible]

Lead [illegible]

[illegible] 10-5 [illegible] monograph [illegible]
[illegible] TS [illegible] 300~) acetic acid [illegible]
xylenol orange indicator [illegible] 50 [illegible] 50 [illegible]
[illegible] 5 [illegible]) methenamine R [illegible] mixture R
[illegible] VS [illegible] 0.05) disodium edetate [illegible]
VS [illegible] 0.05) disodium edetate [illegible] 1 [illegible]
.Pb [illegible] 10.35 [illegible]

Magnesium [illegible]

[illegible] 10-5 [illegible] monograph [illegible]

[illegible] TS ([illegible] 70~)hydrochloric acid [illegible]
ammonium chloride [illegible] 10 [illegible] 50 [illegible]
Mordant Black 11 indicator mixture R [illegible] 100[illegible] TS 10.0 [illegible] buffer TS
[illegible] VS ([illegible] 0.05) disodium edetate [illegible]
VS ([illegible] 0.05) disodium edetate [illegible] 1 [illegible]
.Mg [illegible] 1.215 [illegible]

Zinc [illegible]

[illegible] 10-5 [illegible] monograph [illegible]
[illegible] TS ([illegible] 300~) acetic acid [illegible]
xylenol orange indicator [illegible] 50 [illegible] 50 [illegible]
[illegible] ([illegible] 5 [illegible]) methenamine R [illegible] mixture R
[illegible] VS ([illegible] 0.05) disodium edetate [illegible]
disodium edetate [illegible] 1 [illegible]
.Zn [illegible] 3.268 [illegible] VS ([illegible] 0.05)

NON-AQUEOUS TITRATION [illegible]

[illegible] bases [illegible] acids [illegible]
[illegible] hydroxyl [illegible] hydrogen [illegible] ions [illegible]
[illegible] recognize [illegible] Arrhenius [illegible]
[illegible] Bronsted [illegible]
[illegible] .proton acceptor [illegible] proton donor [illegible]
electron [illegible] Lewis [illegible]
[illegible] neutralization [illegible] pair
.[illegible] coordination bond [illegible]
[illegible]
(H_3O^+) hydronium ion [illegible]
acetic [illegible] protophilic [illegible] .acid anion [illegible]

[illegible] proton [illegible] ($CH_3COOH_2^+$) acetonium ion [illegible] acid [illegible] perchloric [illegible]

[illegible] .nitric [illegible] hydrochloric [illegible] sulfuric [illegible] hydrobromic [illegible]

[illegible] acetic acid [illegible]

[illegible] ethylenediamine [illegible] base [illegible]

[illegible]

[illegible] leveling effect [illegible]

[illegible]

[illegible] butylamine [illegible] pyridine [illegible] phenol [illegible]

[illegible]

[illegible] potassium methoxide [illegible]

[illegible] lithium methoxide [illegible] sodium methoxide [illegible]

.tetrabutylammonium hydroxide

[illegible]

[illegible]

[illegible] physiologically active [illegible]

[illegible] .titrant [illegible]

[illegible] pharmaceutical preparations [illegible] ingredient [illegible]

.carriers [illegible] excipients [illegible]

[illegible] acid halides [illegible] types [illegible]

[illegible] amino acids [illegible] carboxylic acids [illegible] acid anhydrides [illegible]

[illegible] phenols [illegible] imides [illegible] xanthines [illegible] barbiturates [illegible] enols

[illegible] amins [illegible] .sulfonamides [illegible] pyroles

[illegible] quarternary ammonium [illegible] hetrocyclic [illegible]

[illegible] inorganic acids [illegible] alkali salts [illegible]

[illegible] halogen acids [illegible]

halide ion [illegible] mercuric acetate [illegible] acetic anhydride [illegible]

[illegible] .unionized mercuric halide [illegible]
[illegible] acetylatable groupings [illegible]
.crystal violet [illegible] malachite green [illegible]
[illegible]
[illegible]

[illegible] volumetric [illegible] basic compound [illegible]
[illegible] glacial acetic acid [illegible] perchloric acid [illegible]
[illegible] dioxin [illegible]
[illegible] .methanol-toluene [illegible] lithium methoxid [illegible]
[illegible] tetrabutylammonium hydroxide [illegible]
[illegible] sodium methoxide [illegible]
[illegible] gelatinous [illegible]

[illegible]
[illegible] atmosphere [illegible]
[illegible] 1 [illegible] 0.1 [illegible] 0.01 [illegible] blank
[illegible]

[illegible] .potentiometrically [illegible]
[illegible] calomel [illegible] reference [illegible] electrode [illegible]
[illegible] /lithium perchlorate [illegible] salt bridge [illegible]
[illegible] acetic acid TS
[illegible] crystal violet [illegible]
[illegible] establishing [illegible]
[illegible]
[illegible] V [illegible] electromotive force [illegible] E [illegible] dE/dV [illegible]
[illegible]

[illegible] coefficient [illegible]
compensant [illegible] expansion

[illegible] standardized.

RECOMMENDED PROCEDURES [illegible]

[illegible] **Method A** [illegible]

[illegible] crystal [illegible] neutralized [illegible] glacial acetic acid R1 [illegible] blank [illegible] violet/acetic acid TS [illegible] determination [illegible] indicator [illegible] mercuric acetate/acetic acid TS [illegible] 10 [illegible] TS [illegible] 3-2 [illegible] monograph [illegible] titrant [illegible] standardization [illegible] TS [illegible].

[illegible] potentiometrically [illegible] electrode [illegible] (TS [illegible] 350) [illegible] saturated calomel cell [illegible].

[illegible] (t_1) [illegible] (t_2) [illegible] assay [illegible] [1 + 0.001 (t_1 − t_2)] [illegible].

[illegible] **Method B** [illegible]

[illegible]

[illegible] determination [illegible]

potentiometrically equivalence established

reference electrode electrode

aqueous potassium chloride saturated calomel

TS (3.50)

electrical resistance

NITRITE TITRATION

aromatic amines

electrometric

circuit platinum

device 100-50 potential

indicating needle 1- 0.1 current

magnetic stirring mechanical

nitrogene

20 0.5

(1000~) nitric acid TS

ferric chloride R 1

RECOMMENDED PROCEDURE

50 TS (250~) 20

[illegible] catalyst [illegible] (0.1 [illegible]) sodium nitrite VS [illegible] 15 [illegible] burette tip [illegible]

.15 [illegible] vortex [illegible] 0.1 [illegible] 1 [illegible] deflects [illegible] 1 [illegible] reagent [illegible]

[illegible]

DETERMINATION OF WATER BY THE KARL FISCHER METHOD

[illegible] Karl Fischer [illegible] anhydrous [illegible] iodine [illegible] sulfur dioxide [illegible] pyridine [illegible] .atmospheric moisture [illegible]

[illegible] gas inlet tube [illegible] vent tube [illegible] burette tip [illegible] desiccant [illegible] side arm [illegible] TS [illegible] .airtight [illegible] .automatic burette [illegible]

[illegible] electrical circuit [illegible] V 2 [illegible] V 1.5 [illegible] platinum electrodes [illegible] microammeter [illegible] .Ω2000 [illegible] resistance [illegible] 15-10 [illegible] 50-30 [illegible] .voltametric [illegible]

[illegible] polarizing current [illegible] .microvoltmeter [illegible] potential difference ([illegible]) [illegible] .voltage [illegible] graphically [illegible] plotting [illegible] .potential [illegible] versus

RECOMMENDED PROCEDURES [illegible]

A [illegible] **Direct titration** [illegible]

[illegible] dehydrated methanol R [illegible] 20 [illegible] .TS [illegible] 1 [illegible] .Karl Fischer reagent TS [illegible]

B [illegible] **Backtitration** [illegible]

[illegible] dehydrated methanol R [illegible] 10 [illegible] .TS [illegible] TS [illegible] 1 [illegible] 1 [illegible].

[illegible] R [illegible] TS [illegible] 2.5 [illegible].

DETERMINATION OF METHOXYL [illegible]

[illegible] methoxy-groups [illegible] methyl iodide [illegible] distilled [illegible] hydriodic acid [illegible] .titrimetrically [illegible]

Apparatus [illegible]

[illegible] 25 [illegible] flask [illegible]

Ȥǰǿƚǌ ǺȒǕ ǵåşÂħ ǦǛDZȤǻǠ ȷȤȮǨ .carbon dioxide ȷȤǟÀȮǜ ǼǢÊõǕ ǗǝÀǺ ȷÀÀÀDZ ŎǹǼȠ ȻǼŌǒ ÛȽŸȠ 1 ÀÛŐǟ ğǟàÀȡ ȤǢȚǨ ǵǼǢǷDZ ȤǰǿǞ ȧȤȤ ȝȓȤǶ .ȽŸȠ 9 ǦǟǟÀ ǗŸǹǟá ÀÛŐş ȽȅȨ 25 ǡǿÀŎǶ ţÀÀǨǿÀǟ Ûcondenser ğǟÀȗÀȗ ȯȤŸȚ ȡȠ ŎȠ 5 ğǟàÀ8ǜǟ ȤǬȚÀħ ƂǕ ȣÀȒǶ .ȯÀţǟ ȡȠ ŎȠ 2 ǦǟǟÀ ȝŸȝ ɃȤǪƠ ǦǦȅÀħ scrubber device ǡȤǦǕ Ž ğǟàÀ8ǜǟ ȤǬȚħ ȡȠ ǯÀǺţǟ ǗǷǪÀ .TS (ȯ/ȟ 50) antimony sodium tartarate ǦǢǪȤƚǢǪȷǟ ÿȤÀáȤÔǜǟ Ž ȜõǕ ǦƚǝŸħ ŎDZȷ .ŎÊŸÊǪǜ ȝŸȝ ƙȯȤȍȤţǟ ȯÀǦŌǪȅȑǟ ɃàÀǷDZ ȯşǕ Ž ȵȋ Àţǟ ŎǝÀÊǜ ǴÛȅ ǨƠ Ȅƚ8ÀÀ ŎȍÀÀţǟ ȡȠ şǕ ÀÀÀÔǞǟ ǗùşÀǺţǟ ǯÀDZǺǜǟ ȡȠ ŎǝÀȅȤǟ àÀǷƨǟ ȡȠ ǦǛÔÀÀħ ǒǟÂDZǕ ŎȍȤǨ ÛȤǢȚÀǿǪǜş ȯÀƚǶǪȅȑǟ .ǦÀşÀȮǜ

RECOMMENDED PROCEDURE ǸǮ Ǐ Ț Ǟǳ!ƒ ǺƒƧȠǗƒ

.ȷÀǢŸȡ ğǟÀõ ȝȠ ȷÀǢŸȡ ǦǛDZȤǵ Ž ÛǵåşÀȤǵǟ Ž ȡǶǶħ ȤȽ Àƚõ ÛǦǢùȤǦȒȠ ǦǪşǶȤħ ÛǵÀǢǪǺţǟ ǵåÀţǟ ȡȠ ǦƚõȝȓȤǶ ÛTS (ȯ/ȟ 970~) ŎÀáȤÀşǿǼǢǷǟ Ȑ ƥ ȯȤŸȚ ȡȠ ŎȠ 5ş melted phenol R ǿȤǷÔǞǟ ȯȤǼÀǜǟ ȡȠ ŎȠ 2.5 ȣÀȒǶ ȯşȷǟ ƂǕ ŎȠ 6 ǦǟǟÀş ÛȯÀǦŌǪȅȑǟ ɃàÀǷDZ ƂǕ TS ÿȤǢȅÀǨȤǦǜ ğÀǪǢȅǕ ȯȤŸȚ ȣÀȒǶ .ȤǰǿǞ ƂǕ ǦǛDZȤǻǠ ŎȍȤǶş ȄǪÀDZǪħ ǒǗÛǟ ȷÀÀÀDZ ǿÀƚǶ .R ÿşȜǜǟ ȡȠ ğǟÀÛȩ 6 ȣÀȒǶ ȯÀǦŌǪȅǟ àÀǷDZ Ŏõ ƂǟşÛǗǿǪÀǯǜǟ ƂǕ ŎȠ 4 ǦǟǟÀş ÀƚǷȠ ǼǢŸƚǌ ȤÛǸ ŎǝÀÊǜǟ ȡÀǺÊǶş ÛȷÀǢŸǺǜǟ ǦǛDZȤǻ ɃÀǨǺǜǟ ǗǿǦǪÀƨǟ ţǟǿǿǜǟ ȯŸȠ ȡȠ R ȷȤǟÀȮǜ ǼǢÊõǕ ǗǝÀǺ ȡȠ ŎǯȠ Ž ÛȜÀȠǕ ǦȅÀħ ǵÀǢǷDZ ǦùÀȅȤǟ şǕ mantled microburner (ǗǿǪşÀȮȠ ƙǺÊǨ ȌǢƚȩ) ȝáÀħ ǗǿǪşÀȮȠ ÿÀǪȡ ǦǢȤÀõ ǦŐǢȩá 30 ȷȤȮǨ áǟȤţǟ ÀǯõǕ ŎDZȷ .ȤǰǿǞ ǦȤÀÊȠ ȤÔǪ ȝŸȝǕ ƂǕ ƂÀ8ǜǟ ŎǝÀÊǜǟ ǵÀǸǕ ȝÀǨÀǨ ǦȝÀÊǜǟ ǺǾȽ 250 ǦǶȅ ǦǢùşÀƯ ǦǛDZȤǵ ŎǹǟáǕ ƂǕ ȯÀǦŌǪȅȑǟ ɃàÀǷDZ ȡȠ Ŏõ ğÀȤǪǶħ ŎÊ8ǶǕ .àÀǷƨǟ ǯǿÀȠ ƂǕ ǼǪƚǪǜş ŎȝÀÀǪǜǟ .TS (ȯ/ȟ 150) ÿȤÀáȤÔǜǟ ğÀǪǢȅǕ ȯȤŸȚ ȡȠ ŎȠ 5 ȝŸȝ ɃȤǪƠ ŎȠ

1080~) (ŎǢȠǿȤÀǜǟ) ŎǢȠǿȤÀǜǟ Ȑ ƥ ȯȤŸȚ ȡȠ ğǟÀÛȩ ȣÀȒǶş ÛŎȠ 125 ǡǿÀŎǶ ÀȠ ƂǕ ŎǝÀÊǜǟ ȽDZǵ ȔǦȒǶ ŎǢȠǿȤÀǜǟ Ȑ ƥ ȯȤŸȚ ȡȠ ǵÀÛȩ 12 ȣÀȒǶ Ż ȡȠş ÛÿşȜǜǟ ƂǕ ǼǝÀǶǜǟ ȷȤǜǟ ȝȉŸǪ ȝǿǪǵ ǦǛDZȤǻǠ ǿǟǼǶ .TS (ȯ/ȟ ǿÀǺǦǜǟ ȡƚȒǪţǟ ÀǻǠ ÿşȜǜǟ ȡȠ ǦǢǿǟ ɃǕ ǦǟàÀǕ ȽǪǒ ŎȠÀõ ŎŎȊǟ ȝȤǪǶţǟ ǯÂƚǶş ǦǛDZȤǻǠ ǼÊǶş ÛTS (ȯ/ȟ 1080~) Ȑ ƥ ȯȤŸȚ ȡȠ ŎȠ 5ş R ÿȤǢȅÀǨȤǦǜ ǼÀáȤÀ ȡȠ ȟ 1 ȣÀȒǶ ÛǦŐǢȩá 2-1 ǵǼȠ ǼõǨǜ ȯȤŸǂǟ õÀǪǶş ÛŎǝÀÊǜǟ ȧȤȤ ȯȤŸȚ áȤDZȤǟ VS (ȯ/ȯȤȠ 0.1) ÿȤÀáȤÔǜǟ ğÀÀŸȅȤǢǪ ȯȤŸǶƚǌ ǿǟǶǶǞǟ áȤǢǜǟ ÀÀÀǶǶş ÛTS (ȯ/ȟ 100) ŎÀǿȤÀŸÊǜǟ VS (ȯ/ȯȤȠ 0.1) ÿȤÀáȤÔǜǟ ğÀÀŸȅȤǢǪ ȯȤŸȚ ȽDZǵ DZÀÛǶş ÛǵȜǪǺǞǟ ǵåÀţǟ ȷşá ǦǢŸƚǶǜǟ ǿÀǪǶ .ÀǶȊƚõ TS ÀȊÀǜǟ .ŎǢÊõȤǯǞǟ ƙǢǶǨ Ž ŎŸǷǪÊǞǟ ȽDZǻǟ ȡȠ ŎƚǶǪÊǞǟ

.(CH₃O) ŎǢÊõȤǯǞǟ ȡȠ ȠŸȠ 0.5172 ȕȤÀȮǶ VS (ȯ/ȯȤȠ 0.1) ÿȤÀáȤÔǜǟ ğÀÀŸȅȤǢǪ ȯȤŸȚ ȡȠ ŎȠ 1 Ŏõ

DETERMINATION OF NITROGEN DžĩШЊϸĦĜǁƐ DžĩĩÿɫĪ

RECOMMENDED PROCEDURES Ǵŋǰʋ Ĭ Ţ Ădž!ƒ ƘƒƇƒƨɳŰƒ

A ɦʂĭϸƲǁƐ **Procedure for macrodetermination** ǎŊǰϸĜǁƐ DžĩĩÿɫĪǁƐ üШŬ ƀɛϸШǕƐ

ǰ ÂɳɖɳȟƝ 1 ȣȦȒɫ ÛŌɳ 200 ǦĦè ĘȦĦä ǦŸΛζù ǦŸDZζǵ Ž gåşȦζǧȁ Ž ǦȦĒȞţä øȦǪǹɍä gåȦɳ ɖɳ øäǼŐţä Ʒȓζɫ âȦĦƲȷä ğȦȦŸè ɖɳ Æǵäş ŏÂDZş R ǦɆəȦɳǋŸä ÿζΛåζÔä ğȦȦŸè şǖ R ÿζɆèȦǩζǦä ğȦȦŸè ɖɳ ŏäÂDZǖ 10 ɖɳ ǢȬȦɳ nitrogen- (ȯ/ȟ 1760~) ƙDZşȦǪǦä ɖɳ ƃȦʅä ȰΛøζȦŸÊä ȐƥȯζŸŢ ǦζȦȓǕ Ȱäǽ ƷǪȦ Ûcopper (II) sulfate R ɁŸƷ ǰ ÂȶɖȦǼÊɫ .gåşȦζǧȁ Ž ɖȦĦţä ȰΛøζȦŸÊä ȐƥɖɳşgåȦţä ɖɳ ğȦɆȶÒä ȯȦȶȞǪèȦæ free sulfuric acid TS ǦŐȦȦÛæ ɖȦĦɫ Ɓ Ȧɳ ɁȦȵǖ ǦŌɆęå 30 gǼɳ ȤÛŸæ ɁŸȣɫş ɉζŸä ȦȒȵǖ ǿȣȦȍ ȯζŸŢ ɁŸƷ ȯζÔΣä ɭǪȦ ɁøǪǵ ƘȣȍǢȜ Ƃǖ ȤȦǼȦɫş ÛåǶɫ .ǼəäÂä ƙǼÊǪä ɖɳ ǦŸDZζΣä ɖɳ ɃζŸȞä ŏÂƨä ǦȦęζö ğȦüȦǪǵɍä ţȦǦǩǖ Æƶ ÜgåşȦζǧȁ Ž ɁȦȵǖ ɉζÒɳ ȯζŸŢş granulated zinc R ǢĦǦĦȶţä ȰǪǼä ɖɳ ǦĦÛę ȣȦȒɫş ÛǦǦèȦȦɳ ğȦüȦǪǵä ţȦǦǩȦæ ÛŏȦţȦæ Ōɳ 85-75 ǦɆȶȭ gåȦΛä ɭǪǩ ɉǖ Æƶ .ŏȦţä ɖɳ Ōɳ 25 Ž R ÿζΛåζÔä ğȦȦŸèζɆǪ ɖɳ ȟ 2ş R ÿζΛåζÔä ǼɆÊȭşøǼɆȽ ȟ 15 ɖɳ ǦŸDZζΣä ŌȍζɫƝ .ǦΛζŸŌä ǼΛǼì ÛƘÛŌǪä ŌǦę ÛǰΛȦţä ɉζÒΛ ɉǖ ɉȦȶȒǻ ÛȦΛøşȦȓ Ȱäǽ ɉȦȭ äǽǖ Ûÿζ ΛåζÔä ǼɆÊȭşøǼɆȽ boric ȰΛøζǦä ȐƥȯζŸŢ ɖɳ Ōɳ 16 Ōȵäå Ƃǖ gøȦĦƲǪţä ȦɆǪζɳȷä ȦÛŌɫ ÛğȦΛζǪĦƲţä ʓȦȶɫ ÛƘÛŌǩ äȦǷDZ Ƃǖ äøζζ ȯζǪȦǯΛɋä/ŌɆǯɆţä gȦȶǵ ȯζŸŢ åζDZζæ VS (ȯ/ȯζɳ 0.005) ȰΛøζȦŸÊä ȐƥȯζŸĦƲȶê ȦȦȞɫş Û(ȯ/ȟ 50) acid TS åäȦţä gåȦţä ɖɳ gøȦĦƲǪţä ȦɆǪζɳȷä Ōǯȶɫ ƙǩȦȦȦȞţä ƙæ ȧȦȦä ÜȦȽøȦǪȵä åäȦţä gåȦţä ɉşå ǦɆŸȶȞä øȦȦǪɫ .ȦĦÎȶȭ TS .N ɖɳ ɳŸɳ 1.401 ŏżȦÒɫ VS (ȯ/ȯζɳ 0.05) ȰΛøζȦŸÊä ȐƥȯζŸŢ ɖɳ Ōɳ 1 Ōȭ .ȦȽøȦǪȵä

B ɦʂĭϸƲǁƐ **Procedure for microdetermination** ǎŊǰϸǀĎǁƐ DžĩĩÿɫĪǁƐ üШŬ ƀɛϸШǕƐ

ğȦȦŸè ȯζŸŢ ɖɳ ğäȦÛę 3 ȣȦȒɫ ÛǼèȦȦɳ ɭȒȽ āζǦǖ Ž gåşȦζǧȁ Ž ɖȦĦţä øȦǪǹɍä gåȦɳ ɖɳ øäǼŐţä Ʒȓζɫ 1760~) ƙDZşȦǪǦä ɖɳ ƃȦʅä ȰΛøζȦŸÊä ȐƥȯζŸŢ ɖɳ Ōɳ 1ş ÛTS (ȯ/ȟ 190) copper (II) sulfate âȦĦƲȷä ÿζɆȦɆŸɆÊä ɖɳ ɳŸɳ 10ş R ǦɆəȦɳǋŸä ÿζΛåζÔä ğȦȦŸè ɖɳ ȟ 1 ȣȦȒɫş ÜåǶɫ ÜĘəȦęå 10 gǼɳ ȤÛŸæ ɁŸȣɫş TS (ȯ/ȟ (Ƃǖ Ōȍζɫ şǖ) Ƃǖ digestion tube ɭȒŢä āζǦǖ ɖɳ ğȦΛζǪĦƲţä ŌŌȦɫ .åȦȦɫş ǦƷȦè 1 gǼɳ ȤÛŸæ ɁŸȣɫ Ûselenium R (ȯ/ȟ 400~) ÿζΛåζÔä ǼɆÊȭşøǼɆȽ ȯζŸŢ ɖɳ Ōɳ 6 ȣȦȒɫ ÛȦɆǪζɳǪǭ microdistillation ɃşȦÒȶä ƘÛŌǪä äȦǷDZ 50) TS ȰΛøζǦä ȐƥȯζŸŢ Ōɳ 5 ɖɳ ǰ ΛÂɳ Ž gøȦÛŌä ƷȶDZɫ ÛĘəȦęå 7 gǼɳ ȦÛŌɫ ÜǦŸDZζΣä Ǝʒ ɉȦΛȦƨä øȦȶɫş TS ȯζŸĦƲȶê ȦȦȞɫş TS methylthionium ÿζɆǼǯŸǯɆţä ǼΛøζŸȭ/ŌɆǯɆţä gȦȶǵ ȯζŸŢ ɖɳ gȦÛęş ÛŏȦţä ɖɳ Ōɳ 5 Û(ȯ/ȟ ƙǩȦȦȦȞţä ƙæ ȧȦȦä Ōǯȶɫ ÜȦȽøȦǪȵä åäȦţä gåȦţä ɉşå ǦɆŸȶȞä øȦȦǪɫ .VS (ȯ/ȯζɳ 0.015) ȰΛøζŸȭşøǼɆŢä Ȑƥ ŏżȦÒɫ VS (ȯ/ȯζɳ 0.015) ȰΛøζȦŸÊä ȐƥȯζŸŢ ɖɳ Ōɳ 1 Ōȭ .ȦȽøȦǪȵä åäȦţä gåȦţä ɖɳ gøȦĦƲǪţä ȦɆǪζɳȷä

.N [illegible] 0.210

DETERMINATION OF IODINE VALUE [illegible]

[illegible] 100 [illegible] %70 [illegible]

[illegible]	*Iodine value* [illegible]
1.0	20 [illegible]
0.25 - 0.5	60 - 20
0.15 - 0.25	100 - 60
0.15 - 0.10	100 [illegible]

RECOMMENDED PROCEDURE [illegible]

[illegible] carbon R tetrachloride [illegible] 15 [illegible] 500 [illegible] 300 [illegible] 30 [illegible] iodine bromide TS [illegible] 25 [illegible] 150 TS (80 [illegible]) [illegible] 20 [illegible] TS [illegible] VS (0.1 [illegible]) [illegible] (*a*) [illegible] VS (0.1 [illegible]) [illegible] (*b*) [illegible]:

$$\frac{(b-a)\times 0.01269\times 100}{\text{[illegible]}} = \text{[illegible]}$$

[illegible]

DETERMINATION OF PEROXIDES IN FIXED OILS

RECOMMENDED PROCEDURE [illegible]

15 [illegible] 3 [illegible]

250 ... 30 ... 1 ... 1.3 ... 1 ... 100 ... 3 ... TS ... VS ... 0.01 ...

DETERMINATION OF SAPONIFICATION VALUE

fatty acids ... 1 ... hydrolysis ...

blank ... 50 ... 35.5 ... VS ... 0.5 ... 40 ...

RECOMMENDED PROCEDURE

200 ... 2 ... reflux ... TS1 ... 25 ... 30 ... condenser ... TS ... 1 ... VS ... 0.5 ... VS ... 0.5 ... (*a*) sample ... (*b*) ... VS ... 0.5 ... formula ...:

$$\frac{(b-a) \times 0.02805 \times 1000}{(\ldots)} = \ldots$$

DETERMINATION OF UNSAPONIFIABLE MATTER

... "unsaponifiable matter ..." term ... alkali hydroxides ... ether.

Ȥǰ̆ǪŁê gắşÂɧ ǦŸĐȤȥǵ Ž ÛgắşÀȥǧ Ž ǦÆĦɧ ɄŁ ÀŧŐ ÛǦĔŭȥǦȒŁê Ǧɸşàȥɳ ÛøÀǪǹꞦ gắÀɳ ȡɳ ǦĔŧŐ Ȝȓȥȴ 0.5) ȯȥɸǯɋ/ȳȥĔèÀȥǦ ÆĔÊŐşøÆĔŁ ȯȥŸƮ ȡɳ Ōɳ 25 Ȝɳ ǦȜÀè 1 gÆɳ ɄəÀɳ ȳÀþ Ž ɁŸ8ȴş (âȥȮȜ) ɄȜȥĐȤø Ōɳ 50 ȯÀŧǪèÀ ŌȮȥ ŏÀȜş ŌǹắƂ ǦŸĐȤȥΣ ǧÀȥǪƮ ŌÊ8ȴ .ǧÀȥǪɄŧŸ ÀǩȥǪɳ ɄøɸøşắŌÀɄǪ ÛVS (ȯ/ȯȥɳ ȡɳ ÛŌɳ 50 ÀȚÀɳ ŌŐ ÛǦĦÀǪǪɧ ǧÀĔŧŐ 3 ǦùÀèȥ ȤĔÀĦŏ ɳȒƪÀ ȮŸǺǪÊŀ ÛŸĔȩ ÆȥắŐ ŌəÀÊŏ ɉȥȮÀ ÀŧÆş ÛŏÀţ ȡɳ Æʑ .(ǧÆĔÊŐşƘǦŏ ȡɳ ȹÀǹ ƘǪɉ ɉȥȮÀ ɉ Æʑ :ÀÀØƠ) R ƘǪɉ ȡɳ ƂşɉǦĔŧȮÀ ǦŸĐȤȥΣ ŌÊ8ȴ ÛR ƘǪɉ ŌĔŏÀŧ ɭȒȴ .separator ŌȎÀŏ ŏÀȜş Ž ŌȮÎǪ ɉ ȡȮȥ ɃØŏ Ȕ8ȒŏÀÀɄǪ ǦÀÀĦş ÀǩȥǪɳ ŌȮÎ ǦÛĔΣ ţÀǦǩ ÛǦŌĦɧ ǦŸò gắÀɳ ɁŸȜ ǦÀȥǪƮ ǦÀƘǪɉ ŌĔŏÀŧ ǨɸÀŐ ǣǽ) .ŏÀţ ȡɳ Ōɳ 20 ɁŸȜ ɃȥǪȜ ÀǹǕ ŌȎȥ ŏÀȜş Ž ǦÀƘǪɉ ŌȎÀŏ ŏÀȜş ȭÀɄŀ .(R ƘǪɉÀ ǴĔȉÀǪŏ ȧøş ŌÊ8ȴş fat ȡŁÆŏ ȡɳ ȹÀǹ ǴĔȉÀǩ ȧøş ƎȜ ŌȎÀŏ ŏÀȜş ƂǕ ǴȉÀȴ ŌÊ8ŀ .ǦĔəÀţ ǦŌǦÛŏ ȡɳ ȮŸǺŏ ɭǪş ÛɎȎÀÆŏ ɉɎəÀÊŏ ȭÀǪŀ ÛȤĔÀĦŏ ȤÀŏ ɉşắ ƐəÀɋắ ȜȒǦ ȤĔÛŸŏ ɉøşÆŏÀ ȡɳ Ōɳ 20 øÆŌɳ ǧÀɳ ǪɎǪ žÀĦŀ Ż ǗŌɳ 20 ÀŧȚÀɳ ŌŐ ÛŏÀţ ȡɳ ƙǪĦÀǪǪɧ ƙǪĔŧȮ ȤĔÀĦŏ ȤÀŏÀ ɃƘǪɉ ȯȥŸŧ ŌÊ8ȴş ɁÀǹɉş ǦÆÀŏ ƙ ȤÀĦ ȤÀŀ Û(ɄəÀɳ ȤȉÀŐ :ǦƮǵɎɳ) VS (ȯ/ȯȥɳ 0.5) ȳȥĔèÀȥǦŏ ÆĔÊŐşøÆĔŁ ȯȥŸƮ ǦŌǦÛŏ ǴǦȎǩ ɁøǪǵ ÛŌɳ 20 ÀȚÀɳ ŌŐ ÛŏÀţ ȡɳ ǦĦÀǪǪɧ ǧÀĔŧȮ ŌÊ8ŀ ÆƘǹǕ .ǦƨÀĦɧ ŌŐ ÆĦ ŏÀţ ȡɳ Ōɳ 20 øÆŌɳ ŏÀȜş ŌÊ8ŀ ÛǦɸşàȥɳ ǦŸĐȤȥǵ ƂǕ ǦÀƘǪɉ ǦòɎǪ ŌŌÀ .TS ȯȥɸǯɋ/ƙÀŏÀǪȥ ȯȥÆÀŏ ȯȥŸƮ ɁŸȜ ǦÀȥŸȩ Ƙȡ ǦĔəÀţ .R ɉȥǪèɉ ȡɳ Ōɳ 3 øÆŌɳ 8ÀȒŀş ǧÀùÀǪǵꞦ ţÀǦǩ Ȝɳ ƘǪɉ ÀÛŌŀ ǗR ƘǪɉÀ ŌȎÀŏ

ŌəÀɳ ŌȮÎ ŌÊŧŀ ɉ ŌȒÀÀ ɄøǪŏ ÛǦŸĐȤȥΣ ȡɳ ŌɳÀŐ ŌȮÎ ŏȥƮ ȡɳ ȤĔÀǹ øÀĔǩ gÆȜÀÊɳ ÆÀØţ ȯÀŀ ǨÀǯŏ ɉàȥŏ ƂǕ ȤÀĐŀ .°ÿ 60 ǦÀÀȩ gøÀǵ ǦĐȤøÆ ɄəÀɳ ȳÀþ Ž ÛǦÀŌǩ ŌɳÀŐ ŌȮÎ ȄŧŘȴ ÛɉøşÆŏÀ ȭÀɄŀş ÛTS (ȯ/ȟ 750~) ȯȥɸǯɋ ȯȥŸƮ ȡɳ Ōɳ 10 Ž ǦŸĐȤȥΣ ǧÀȥǪƮ ȁØȴş °ÿ 80 ȡȜ ÆÀÂǩ ꞦgøÀǵ ǦĐȤøÆ ȡɳ ƂÀƪ ȳȥÀắȥȎŏ ÆĔÊŐşøÆĔŁ ȯȥŸɄŧê ÀÀĦŀ .TS ȯȥɸǯɋ/ƙÀŏÀǯȥ ȯȥÆÀŏ ȯȥŸƮ ắȥĐȤ ÀŌǦÊɧ ȯÆĦǪÊţ TS ȯȥɸǯɋ /ƙÀŏÀǯȥ ȯȥÆÀŏ ȯȥŸƮ ȯÀŧǪèÀ ÛVS (ȯ/ȯȥɳ 0.1) carbonate-free sodium hydroxide ǧÀɸȥÀȮŏ ȡȜ ÆÀÂÀ Ꞧ ŌŸȚǪÊţ VS (ȯ/ȯȥɳ 0.1) ǧÀɸȥÀȮŏ ȡɳ ƂÀƪ ȳȥÀắȥȎŏ ÆĔÊŐşøÆĔŁ ȯȥŸƮ øÆŌɳ ɉÀŐ ǣǽ .ÀĦÎŧŐ ɁŸȜ ȡȎǪŏ ǦŸÀŌŏ Ƙȡ gắÀţ ÆÊɄŀ .ȡȎǪŏ ǦŸÀŌŏ Ƙȡ gắÀţ ÀŧŐ ȻØǹǕ ÆĐȤŏ ɉşàȥţ øÆŌţ ɉȥȮÀ ÛŌɳ 0.2 0.1) ǧÀɸȥÀȮŏ ȡɳ ƂÀƪ ȳȥÀắȥȎŏ ÆĔÊŐşøÆĔŁ ȯȥŸƮ øÆŌɳ ɉÀŐ ǣǽ .ȡŁÆŏ şǕ ǨÀÂŏ ȡɳ ǦÀȥÀɳ ǦĜÊɸ ŌȮȉ Æʑş ȡȎǪŏ ǦŸÀŌŏ Ƙȡ gắÀţ Ž ÀŧŐ gắÀţ ȡɳ øÆŌţ ØǹǗŀ ɉ ȡȮȥ Ꞧ ÛŌɳ 0.2 ȡȜ ÆÀÂÀ ŌŸȚǪÊţ VS (ȯ/ȯȥɳ .øÀǪǹꞦ ắÀĦŀ ɉ

DETERMINATION OF ACID VALUE ƒ ĎžƟǁƐ ɦĎžȉƨ ĎžȉȉŷŁ

.gắÀţ ȡɳ ȳÀǆ 1 Ž ÀΣ ȒŧΣ ȯÆĦǪèꞦ ÆĦÛǪţ ȳȥĔèÀȥǦŏ ÆĔÊŐşøÆĔŁ ǧÀɳÀǆ ɄŸɳ ắÆȜ ɄŁ ȒŧΣ ǦŧĔȩ

… 50 … 250 … 10 …
… TS (… 750~) …
… TS … 1 … VS (… 0.1) …
… VS (… 0.1) …
… 15 …
… (a) …

$$\frac{\alpha \times 0.00561 \times 1000}{(\ldots)} = \ldots$$

BIOLOGICAL METHODS ƕĭɯNjǁNjĭƓǁɛ 5ƥǓ’ǁɛ

[illegible]

MICROBIOLOGICAL ASSAY OF ANTIBIOTICS

[illegible] International Biological Standard [illegible] microorganism [illegible] International Biological Reference Preparation [illegible] International Chemical Reference Substance [illegible] validated [illegible] inhibition [illegible] .assay [illegible] dilutions [illegible] .turbidimetric [illegible]

[illegible] International Unit [illegible] International [illegible] International Biological Standard [illegible] WHO [illegible] Biological Reference Preparation [illegible] Biological Standardization [illegible] .vial [illegible] ampoule [illegible]

[illegible]

RECOMMENDED PROCEDURE [illegible]

[illegible] 4-3 [illegible] Petri dishes [illegible] inoculum [illegible] culture medium [illegible]

ɹʐÒǩ ƙǪŸÔÀÀĦ ƙǪǑǤù ʠɳ ЍǤõÀɳ ƁØ8ʈª agar ǿÀʠǽª ðãÀʠ ɹʐÒʌ ɹÛ ʠÒɛ .ℂÀǫǻÛ ȣʐòʐɳ ʐŁ ÅŧõÃ âÀÊΣª ǿÀǪǫȵ¤ª ÙƱǤʒǩ ĘşùÀÀɳ ɔŸ3 òʐÔΣª ĮǪʌ ǪƱШ ǴHʊƱÕǪǫöª ÂƱõÀǩ ŏÀÎÕǫǫª ĮǪʌ ɹÛ Æz .inoculated ǴHʊǺŸɳ ÙÕʐ ÅŧƬÀɳ ǴʌʐŸĦöª ǴÕǤÛöª ʐŁ Åŧõ gÀŸRHʊʈª ǴHʊƱÕǪöª ÕŧŧǪÊŁ Åɳǻ£Ã3 .ВǿÀƱĦʈª ʠɳ ǴÁŸǪǻĦ ÂƱõªÀǫª ǤǤèÀÀĦ dose Ǧ3ÀDzŸö ǴǽÀDzǪèâș gǻǵ ÀǰõÙ ţǿÂöª ǨǤǪÊĦ ʠɳ Õɳ 100 Õõ Ž ǴHʊƱÕǪöª ʠɳ Õɳ 1 ɔŸ3 ВșÅΣª ǴǪĦʈª ǨǤǪÊʈª ɹʐÒʌ Åɳ gǻ3 ÛǴǻǿǻÛ ȣʐòʐɳ ǨǤǪÊĦ gǿǻÀǵ ɹʐÒǩ ɹÛ Æz Ûvegetative ȤøǩÁǤǫª Ȥǵ ʠɒÀõ ʠɳ ĘŸĦǪÊĦ ʠɳ ¢ǫʐÒɳ ǴHʊƱÕǪöª ɹʐÒǩ ÅɳǻÃ3 .ЍǤèÀÀɳ àÅǤùÛ ǒÀÕǪǫª ĮǪʌ ɹÛ Æz .inoculation ǴƱÕŸǪöª ʠɳà Ž °ȳ 50 - 48 ʠ3 ÁʌÂǨ ɾ molten agar medium ƙǪǐʐɳ ǿÀʠÙ ǴÛÊĦ ȤÕʐʌ ǴÛè ɔŸ3 ʒȓʐŀ ɹÛ Æz ðŸɳqª ĞŸǵÀɳ òŸn . î Ån ÕÒÎª flat bottoms ÀĦÕöª ǴHʊÛÊĦ Ȥøǫªʐòș ǨõÀŀ ãǽÙ ðãÀDZqª ƙÊƠ ĮǪʌ ɹÛ ʠÒɛ ÛǴƱΣª ǿÀǪǫȵ¤ª ǧÀǺaÀõ ŔĦª ʒɳ .ǨǤǪÊŧª ǴÕǤù ǴǫÀÅǫ ÈǫÀΘ ɹÅŧŔů Õöǽș .ǧÅʒÀè gǼĦö °ȳ 4 ǴDZǿǼöª Бů åÀŁŀ ș Ûòʌŧ ĦǪèȵ¤ª ÕƱę ǴʐÀ8öª gǿǻÀǵ ǴDZǿǼª ǴÕƱęå 30 gǼɳ ZDzǪö ǴHʊǺĦʈª ǴəÀÀÔöª 10 ãǿÀÕŀ ţÀÀǩǿÀª ÛȄǫÀDzǪĦ ĮDzǵ ǧãæ sterile ǴŧƱÕ3 gK8ò ǧÀǫªʐÛèª ʒȓʐǩ ÛǿÀǪǫȵ¤ª òʐŸŢ ĘƱǤÛǩ ÕDZj stainless ÜǼÉÔŸö ȳȘÀÕʈª ǽɾʐÀöª ș Û8ÂĮ ÛȜDZÂöª Õ ȳɳ ǴǤèÀÀĦ gǻÀɳ ʠɳ Ǵʒʐ^Ôɳ ÛĮŸɳ 5 ãǿÀŀ ŀŸȵÀǻ ÀÛÛÕª ĮŸɳ ãÀÕȳǫ Ùèʐǿöª Ž ĮŸɳ 10 - 8 ÀÛÛÕª Ζ^ȘÀΘ ÆÕǫ ʠÒɛ ÛǧÀǫªʐÛèɾª ʠ3 ŀɾÆª .ǴƱÕʈª ǩǴǪÊʈª ʠɳ ǴÛè ɔŸ3 Ûsteel ĮǪʌ ǪƱШ ǴHʊƱÁÔöª ɔŸ3 ÆƱǩÀǪǫöª ɹʐÒʌ ɹÛ Æz .ǿÀǪǫȵ¤ª òʐŸŢ ĘƱǤÛǫǫ ƤÀȵÛ àÀÙ òÅŧŧǪǫèª ʠÒɛ .ЍÕǤÊǫ ĮǑĦǫ .ĘùÀÀʈª ÆÕõÀǩ ÆʌΘ

ôÀǪÀʈª ÛǿÀǪǫȵ¤ª gǻÀɳ ʠɳ ǴÕƶʐʈª (ǧÀÁƱÁÅǪöª) ǴÁÁÅÁʈª ÕƱÕÅ+ª ȣș ȣșÀĦǫ ÂƱõÀǩ ʠɳ ǴƱĦDZÀʈª gǻÅʈª ÕƱÕÅŢ ÀŔHʊŀ Æz ǴÊʌÅÕʈª ǴƱęşÉÔɳ ĮƱƱÕǩ ǴƱ8ª .ǤǤèÀÀɳ ǒÅŁÀª ǴŧƱę ǧãæ ǴŧƱÕ3 Ǧǿõǻå Ž Û¢ÊÀǫ ȤøǺÀÕǪöª ÂƱÕÀǪǫÀª ʐÒǩ ɹÛ gǻÀʈª ÕƱÕÅHʊŧõ ôÀǫÀʈª ¢ÊÀǫ ŕÅÎÀöª ÅT gƎǪÁʈª gǻÀʈª ǧÅ3ÀDZ ʠɳ ȿÅÊɳ åÉ3 3ɳ Õęɉª ɔŸ3 ǧÅ3ÀDZ ǫŸǫ òÅŧŔǪèª ʠɳ ǴŸÊŸè ƘŔHǪª ÛòÅǯʈª ÕƱǤè ɔŸ3 ÛǴƱèÉÆŁ ǴƱǿª^ǪĦ ÕÒÎª ǴɳÉÁǪÊʈª ǧÅ3Àɔª ǧÅʌzǪÊɳ ɹʐÒǩ ɹÛ Æz .ǴĦDZÀʈª åÅŔʈª ÙƱǤʒǩ ǴÕÛÀɳ ÀÛȩȿ ȣzƱΣª åÅŔʈª ÂƱõÀǩ logarithm ĮǪʌǿÅdzǫ ƙª ǴęŸŸöª ɹʐÒǩ ÅʈÅǧ .1:2 ǴǤÊª ǧÁÆÆÁÁǪöª ǴƱÆǩȿÀöª ǧÅÊʌÅÕʈª öãÀDZÛ ʠÒŧŧz ÛÕŧŧǪÊʈª ȳÅŢʌöª ŽʌÀÕǩ rectilinear (ǴƱǪÛn) ǴŧƱÕǪÊɳ ŕʐÛn ǧãæ ȣzΣª ǧÅŧƱŸĦǩ gåȿÀzǵª ȤÛĦǩ ÅŧȳƱǵș .ǿÀǪǫȵ¤ª gǻÀɳ ʠɳ ƙÀǫª ʠʌÂŧõÀǩȿ ǴĦDZÀʈª gǻÅʈª ʠɳ ƙÀǫª ʠʌÂŧõÀǩ ȳãÆÁǪèÀª .ÆèÀÀʈª ǴŧƱÕĦöª ǴəǿãÆöª òʐŸHɯ ÛĦʌǿȿÀŕ Õöª ɹÅõ ãæÙÛòʐŸ+ª ãØŁ ZÅÁŀ ÛǪəÆ3 Ûgǻʈª òʐŸ+ ǴƱəÆǤöª gƘŔHʊǪŸö ȳÆÁǪÊŀ ÅɳǻÃ3 Latin square ȤøÆĦŕ ȝªÀɳ ÕÒÎª ǿÀǪǫȵ¤ª gǻÅɳȿ ǴĦDZÀʈª gǻÅʈª ÕƱÕÅŢ ÆĦÀŀ ɹÛ ÕǪŔÀŀ gǻÅʈª ÕƱÕÅŢ ȝŕʐǩ ǪƱШ ĘǤù Õõ ɔŸ3 ÕƱÕÅ+ª ÆĦÀŀ ÛBÀǫª àÀǤùÛ ÕŧŧǪÊŀ ÅɳǻÃ3 .ÕÒÎöª ČŸƱÛǪÊɳ Ȥøǫªʐòș gǻÅŧŸö ɔŸ3ɉª ÂƱõªÀǫöª ɹʐÒǩ ɾ ǪƱШ ČŸǪÅŧɳ ȣșÀŢª ȝŕʐǩș ĘǤÛöª òʐǵ ãșÅǪÕÀª ǿÀǪǫȵ¤ª gǻÅɳ ÕƱÕÅŢș ǴĦDZÀʈª pipette Òư òÅŧŧǪÊÀª Ζ^ȘÀDzǪöª ș ǧÅǫªʐÛèɾª Ž ÕƱÕÅ+ª ȝŕʐǩ .ǿșÅDzǪɳ ÕÒÎª Ǧ3ʐŕʐɳ ǿÀǪǫȵ¤ª gǻÅʈș ǴĦDZÀʈª ÕÒÎª ÅŢÅŸʈ ĦǩzÅõ ȳÁÁǪÊʈª ĮDzΣª ɹʐÒʌ ɹÛ Æz Ζ^ȘÀDzǪöª ÕŧŧǪÊŀ ÅɳǻÃ3 .ÕəÀÊöª ʠɳ ĦÊǫÀDzǪɳ ĦŧƵǵ ȤÛĦŀ .ĦǤÀÀÕǩ ÕɳÅõ

[illegible] 1.5± [illegible] 16 [illegible] 0.1 [illegible]
bioassays.

[illegible] strain [illegible] (4 [illegible]) [illegible] designations [illegible]:

– NCTC [illegible] Colindale [illegible]

– NCYC [illegible] Yeast [illegible] Brewing [illegible] Nutfield [illegible] Redhill [illegible] Surrey [illegible]

– ATCC [illegible] Rockville [illegible] Maryland 20852 [illegible]

[illegible]

Precision of the assay [illegible]

[illegible] fiducial [illegible] limits (P = 0.95) [illegible].

Calculation of results [illegible]

[illegible]:

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tests.
2. C. I. BLISS: *Statistics of bioassay*, New York, Academic Press, 1952.
3. C. I. BLISS*: Statistics in biology*, vol. I, New York, McGraw Hill, 1967
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5. D. J. FINNEY: *Statistical methods in biological assays*, London, Griffin, 1964.
6. W. HEWITT: *Microbiological assay*, New York, Academic Press, 1977.
7. J. PHILLIPPE: *Les methods statistique en pharmacie et en chimie,* Paris, Masson, 1967.

ǦƗşǻɟǟ ƘǩǠèǻ ȸƞ ǼƗǼǶǟ Ž ǦƤƤòƤƞ ǦƗƤƐΣǟ ğǟǻǠȒȽǾ ǦƐƊƤǘƤƐşǠǑţǟ ǦÊƗǠǾȽǾ ɄəǠÔǵqǟ ɭƐǾǪǾ ǦǾƾÛţǟ ȧǠÛǟǟ
.ǦƐȽƐǯęqǟş ǦƐǠùƤǟǟ

ǦƗǻǠǠǟǟ ǦƗƤƐΣǟ ğǟǻǠȒţǟ ǦÊƗǠǾɧ ȓşǠ̀ş ǦǬΣǟ øǠǦǪǹɽǟ ğǠǟǠǾ .4 ȯşǼɐǟ

ǥøǟǠǥ ǦƉøǻ (°ÿ) ȸȒΣǟ	ğǟǼǥƤǟǟ şǠ ȷàƤǟǟ) ǠƐõǠǪǟǟ [b](Ǿɧ 1 Ǿõ Ž ǦƐşǼǟǟ	Ûğ ǠǠÊǠǟǟ ǦəøǟǠ TS ÛªǒǠȽǠǦǟǟ ÛǦȽƐǾǶǟǟ	ÜǨǦǪÊţǟ ǦƐəǠƬǠǟǟ ǒǠȽǠǦǟǟ	øǠǦǪǹɽǟ Ʉǥ ȸəǠõ Test organism	ɃƤƐΣǟ ǻǠȒţǟ Antibiotic
37 35	IU ǦƐşǻ ǥǼǥş 4-1	7.0	ÜCm1 7.1 7.0	ǒǟǠǠÔǟǟ ǥǠƐǾţǟ Micrococcus luteus NCTC 7743; ATCC 10240	ƙèǟǠǪƐèǠǦǟǟ Bacitracin
31 30	IU ǦƐşǻ ǥǼǥş 4-1	6.0	ÜCm1 6.6 6.5	ǒǟǠǠÔǟǟ ǥǠƐǾţǟ NCTC 7743; ATCC 10240	
35 32	ÿǟǠȸ şǠǾɧ 40 10	6.0	ÜCm1 6.6 6.5	ǦƐȽǾǟǟ ǦƗǻƤǾǶǟǟ *Staphylococcus aureus* NCTC 6571; ATCC 9144	ƙÊǾǟǠƐÊǟǟ Cefalexin
35 32	ÿǟǠȸ şǠǾɧ 40 10	6.0	ÜCm1 6.6 6.5	ǦƐȽǾǟǟ ǦƗǻƤǾǶǟǟ ATCC 6538-P	
35 32	IU ǦƐşǻ ǥǼǥş 2 0.5	6.0	ÜCm1 6.6 6.5	ǦƐȽǾǟǟ ǦƗǻƤǾǶǟǟ ÜNCTC 6571 ATCC 9144	ƙǨƤǟǠƐÊǟǟ Cefalotin
35 32	IU ǦƐşǻ ǥǼǥş 2 0.5	6.0	ÜCm1 6.6 6.5	ǦƐȽǾǟǟ ǦƗǻƤǾǶǟǟ ATCC 6538-P	
39 37	IU ǦƐşǻ ǥǼǥş 20 2	4.5	ÜCm1 6.6 6.5	ǦƐƞƤǦǟ ǦƗƤÔǶǟ *Bacillus pumilus* ÜNCTC 8241 ATCC 14884	ƙŸÒèǟǠǪǩøƤŸÒǟǟ Chlortetracycline

ĝøǻÀǵ ǤDZøǻ (°ÿ) ȸȒȠ	ğǻǼǵʐ şǚ ɹàʐ) ÂĿÕÀǬ [b](Öŋ 1 ÕÕ Ž ǦĿöşǼ	Û ğ ÀÀÊÀ ǦǝøǻǺ TS ÛªöÀĿÀ ÛǦȶĿÕĦ	ÜĶǤǬÊţ ǦĿǝÀȚ öÀĿÀǤ	øÀǬǹɼ Ʉǵ ȸǝÀÕ Test organism	ɃʐĿΣ ǻÂȒţ Antibiotic
33 30	IU ǦĿöşǻ ĝǼǵş 0.2 0.05	4.5	ÜCm1 6.0 5.9	ǦĦȶ Î ǦȴʐÔĦ *Bacillus cereus* ATCC 11778	
39 37	ÿǻÀȡ şÀÖŋ 20-5	7.0	ÜCm1 6.6 6.5	ǦÕȩÀ ǦȴʐÔĦ *Bacillus subtilis* ÜNCTC 8236 ATCC 11774	ƙĿèÀÊÕʐŸÖ Cloxacillin
35 32	ÿǻÀȡ şÀÖŋ 8-2	6.0	ÜCm1 6.6 6.5	ǦĿȽǾ ǦȴǻʐÕĦ ATCC 6538-P	
39 37	ÿǻÀȡ şÀÖŋ 10-2.5	6.0	ÜCm1 6.6	ǦĿȽǾ ǦȴǻʐÕĦ ÜNCTC 6571 ATCC 9144	ƙŸèÀÊÕʐŸÖǻ Dicloxacillin
35 32	ÿǻÀȡ şÀÖŋ 8-2	6.0	ÜCm1 6.6 6.5	ǦĿȽǾ ǦȴǻʐÕĦ ATCC 6538-P	
39 37	IU ǦĿöşǻ ĝǼǵş 25-5	8.0	ÜCm1 8.1 8.0	ǦŸĿŋʐǤ ǦȴʐÔĦ ÜNCTC 8241 ATCC 14884	ƙÊĿŋşÀǯøɼ Erythromycin
37 35	IU ǦĿöşǻ ĝǼǵş 1.5-0.5	8.0	ÜCm1 8.1 8.0	öÀÀÔ ĝÀĦǾţ ATCC 9341	
39 37	ǦĿöşǻ ĝǼǵş 14-2	8.0	ÜCm1 8.1 8.0	ǦŸĿŋʐǤ ǦȴʐÔĦ ÜNCTC 8241 ATCC 14884	ƙÊĿŋʐĿ Neomycin
37 35	ǦĿöşǻ ĝǼǵş 20-2	8.0	ÜCm1 8.0 7.8	ǦĿȽǾ ǦȴǻʐÕĦ ATCC 29737	
37 35	ǦĿöşǻ ĝǼǵş 2.05	8.0	ÜCm1 8.1 8.0	ǦȴşÀ Î ǦȴǻʐÕĦ Staphylococcus epidermidis ATCC12228	
33 30	ǦĿöşǻ ĝǼǵş 5-1	6.0	ÜCm1 6.6 6.5	ǦÕȩÀ ǦȴʐÔĦ ÜNCTC 10315	ƙèʐĿʐʐʐ Novobiocin
35 30	ǦĿöşǻ ĝǼǵş 50-10	6.0	ÜCm1 6.6 6.5	öÀÀÔ ĝÀĦǾţ ATCC 9341	
37-35	ǦĿöşǻ ĝǼǵş 300-25	*cø*	ÜCm3 6.2 6.0	ǦʐĦǝ öĶÔÊ *Saccharomyces cervisia* ÜNCYC 87 ATCC 9763	ƙǺǬÊ Nystatin

[illegible] (°ÿ) [illegible]	[illegible] [b] [illegible]	[illegible] TS [illegible]	[illegible]	[illegible] Test organism	[illegible] Antibiotic
39 37	[illegible] 10-2.5	7.0	ÜCm1 6.6 6.5	*[illegible]* ÜNCTC 8236 ATCC 11774	[illegible] Oxacillin
35 32	[illegible] 8-2	6.0	ÜCm1 6.6 6.5	*[illegible]* ATCC 6538-P	
39 37	[illegible] 20-2	4.5	ÜCm1 6.6 6.5	*[illegible]* ÜNCTC 8241 ATCC 14884	[illegible] Oxytetracycline
33 30	[illegible] 2-0.5	4.5	ÜCm1 6.0 5.9	*[illegible]* ATCC 11778	
37 35	[illegible] 100-20	TS3 Û6.0	ÜCm2 7.3 7.2	*[illegible]* *Bordetella bronchiseptica* ÜNCTC 8344 ATCC 4617	[illegible] Polymyxin B
37 35	[illegible] 200-50	7.2	ÜCm2 7.3 7.2	*[illegible]* ÜNCTC 8344 ATCC 4617	
37 35	[illegible] 100-5	7.2	ÜCm1 6.6 6.5	*[illegible]* *Escherichia coli* ATCC 10536	
39 37	[illegible] g20-5	8.0	ÜCm1 8.0 7.9	*[illegible]* ÜNCTC 8236 ATCC 11774	[illegible] Streptomycin
37 35	[illegible] 15-3	8.0	ÜCm1 8.1 8.0	*[illegible]* ATCC 6633	
39 37	[illegible] 20-2	4.5	ÜCm1 6.6 6.5	*[illegible]* ÜNCTC 8241 ATCC 14884	[illegible] Tetracycline
33 30	[illegible] 2-0.5	4.5	ÜCm1 6.0 5.9	[illegible] ATCC 11778	

.TS2 [illegible] TS,TS1 [illegible] *a*

[illegible] *b*

[illegible] *c*
.TS3 6.0 [illegible] dimethylformamide R [illegible]

Culture media [illegible]

[illegible] (4 [illegible]) [illegible] (Cm) [illegible] (167 [illegible]) "List of reagents, test solutions and volumetric solutions [illegible].

Preparation of inoculum [illegible]

[illegible] *Bacillus cereus* [illegible] *Bacillus pumilus* [illegible] *Bacillus subtilis*. [illegible] 6.6-6.5 [illegible]) Cm1 [illegible] 39-37 [illegible] 7 [illegible] 1 [illegible] manganese sulfate R [illegible] 1 [illegible]. 70 [illegible] 30 [illegible] sterile [illegible] 1 [illegible] 10^8 - 10^7 [illegible] spores [illegible] 4 [illegible].

[illegible] *Bordetella bronchiseptica*. [illegible] 37-35 [illegible] 6.6-6.5 [illegible]) Cm2 [illegible] 1– [illegible] opacity [illegible] saline TS [illegible] sterile [illegible] 650 [illegible] %50 [illegible] 4 [illegible].

[illegible] vehicle [illegible] inoculum [illegible] peptone [illegible] (TS2 [illegible]) 70– [illegible].

6.6-6.5 [illegible]) Cm1 [illegible] *Micrococcus luteus*. [illegible] saline TS [illegible] 37-35 [illegible] %80 [illegible] 50 [illegible] 1 [illegible] 4 [illegible] 650 [illegible] vehicle [illegible] inoculum [illegible] peptone [illegible] (TS2 [illegible] 1) 70– [illegible].

[illegible]) Cm3 [illegible] *Saccharomyces cerviciae*. [illegible] saline TS [illegible] 37-35 [illegible] 6.2-6.0 [illegible] %50 [illegible] 1– [illegible]

[illegible] 650 [illegible] [illegible] 4 °C [illegible]

[illegible] TS2 [illegible] 70– °C [illegible]

[illegible] *Staphylococcus aureus* [illegible] Cm1 [illegible] 6.6- [illegible]) [illegible] 6.5 [illegible] 37-35 °C [illegible] saline TS [illegible] 1 [illegible] %50 [illegible]

[illegible] 650 [illegible]

[illegible] TS ([illegible] 5) [illegible] 70– °C [illegible]

STERILITY TESTING OF ANTIBIOTICS [illegible]

[illegible] microorganisms [illegible]

Test conditions [illegible]

[illegible] aseptic [illegible] disinfecting [illegible] germicidal [illegible] air filters [illegible] disinfecting aerosols [illegible] laminar flow [illegible] environment [illegible] static free clothing [illegible] hood [illegible] settle [illegible] particulate [illegible] slit-sampling [illegible] plates [illegible]

Membrane filtration apparatus [illegible]

[illegible] porosity [illegible] 0.45 [illegible] nominal [illegible] 47 [illegible] 700) [illegible] 90 [illegible] 75-55 [illegible]

[illegible]

[illegible]

[illegible]

Sampling [illegible]

[illegible]

Culture media [illegible]

[illegible] fungi [illegible] bacteria [illegible] anaerobic [illegible] aerobic [illegible] variety [illegible] manufacturing [illegible] mercaptoacetate [illegible] criteria [illegible] (Cm5 [illegible]) [illegible] (Cm4 [illegible]) (thioglycolate [illegible]) [illegible] strains [illegible] (100 [illegible]) [illegible] 24 [illegible] lot [illegible] over sterilization [illegible] overheating [illegible]

RECOMMENDED PROCEDURES [illegible]

Membrane filtration test procedure [illegible]

[illegible] (container [illegible] 6-0.3) [illegible] TS1 ([illegible] 1) [illegible] 200 [illegible]

[illegible] 400 [illegible]

[illegible] .TS1 (ò/ȟ 1) [illegible]

[illegible] TS1 (ò/ȟ 1) [illegible]

.penicillinase TS [illegible] (cephalosporin [illegible] penicillin [illegible]

[illegible] Cm4 [illegible] 100-50 [illegible] 100-50 [illegible] .(soybean-casein digest medium [illegible]) Cm5

[illegible] control test [illegible] 100-50 [illegible]

Direct test procedure [illegible]

[illegible] 0.3 [illegible] 10 - 1 [illegible] Cm6 [illegible] 100 - 50 [illegible] Cm7 [illegible] 100 - 50 [illegible] 1.0 [illegible] .Cm6 [illegible] ATCC 6538-P [illegible] 100.50 [illegible] .°ÿ 32 - 30 [illegible] 24 [illegible] .Cm4

Incubation [illegible]

Cm4 [illegible] 7 [illegible] Cm5 [illegible] °ÿ 32 - 30 [illegible] (Cm6 [illegible] .°ÿ 25 - 22 [illegible] (Cm7 [illegible]

[illegible]

.ɄøǟşǟȮǫǟ ɀŧǟȫǟ ǿǟƮşᵾ ŌDZj ȸRΣǟ ȸɳ ȳɀʌ ǟɲᵾ ŽŞ ĠŧŢǫǟɳ ĠŁǟɳà ŌȮǟɀǟǟ ĞĦȾŌǟǧǟ ğǟǫǟǫÊŧǧǟ ĠŁƷşᵾ ȮĦȾǟǩ ǟǟşǟɳ ȸRΣǟ ǟǟƮDZ ɹɀȮʌ ɹᵾ ¢ǟ ǟɀɋǟǟǧǟ ȸɳ .ɃǟƮȮǟ ȮĦȾǟǟǟ ĞÛȅǟɀǟ ¢ǟɳ ÁŌǖǫǟǟ Æz ɀŧǟȫǟ ǟØŁ ŌƷɳ Ş̧gɀȮ ǟǟᵾ .ǟŧǫÊɳ ŌȮÎǟ gǿǟǟg ŌŁDzÊǩ gǟŁƮDzȇ

Interpretation of test results ƥƑĠĦƓƲȼ ƛǝƑĦȥ ƥĭƨƨĦ

ɄøĠŸǩ gǟǟŧǟɀ ÛɄøǟǟzɾǟ ɀŧǟȫǟ control ÆŁǟì ǟÆ3 ǟŧŁɀ Ûğǟǫǟǫ Êŧǟ ĠŁƷşᵾ Ž ɀŧǟȫǟ ɔŸ3 ĠǟǟǟŁ ÆDZɀǩ B ǟæᵾ ǟɀDZş ɔŸ3 ĠǟǟǟŁ ĠNᵾ ÆDZɀǩ B ǟæᵾ .ĠŁǫǟǫ ǿǟǫǫnɾǟ ǟǟĦŁ ɹᵾ ȸÕȸǽ 3ɳ ÛɀŧǟŸȫ ĠǟǟǟŁ ğÆDZş ǟæᵾ .ǿǟǫǫnɾǟ ğǟĠŸÛǫɳ Ž gǟǟŧǟ ÔÎǟǩ .ǿǟǫǫnɾǟ ğǟĠŸÛǫɳ ɄøĠŸǩ gǟǟŧǟɀ ÛɄøǟǟzɾǟ ɀŧǟȫǟ ÆŁǟì ǟÆ3 ǟɳ Ûğǟǫǟǫ Êŧǟ ĠŁƷşᵾ ȸɳ Ǟᵾ Ž ɀŧǟȫǟ .ǟǟĦŧǟ ǿǟǫǫnɾǟ Ž ɀɣʃ ǫÆg ǟɳ ǟæᵾ ǿǟǫǫnɾǟ ǟǟǫDZǟ

Ægj gKĠn ĠŧŏǟƮ ǿǟǫǫnɾǟ ğǟöǟǟDZᵾ ĠŁǫǟÆÔɳ ȳÆ3 ĠŁǫǟȮɳᵾş ǿǟǫǫnɾǟ ǟǟǫDZǟ Ž ɟǫǟŧǟ ÔÎɀ ǩǟ ǟŁŧǫöǟ ÆŸÛǫʌ .öǟƎ٦ǟ

UNDUE TOXICITY ƕƲƥƨƵĦȼ ƕĭƊŽƨ‖ȼ

.ɄøʌŌΣǟ öǟÛ3qǟ ŌDZj ĞƬDZɀŧǟ ĠʌɀŁΣǟ ğǟǟǟÎŘŧŸö Ğùǟǟǟŧǟ ĠŁŧÊöǟ ǟ ǟŁq ǩŁĦǪö ǿǟǫǫnɾǟ ŌŧĦǪÊŁ

RECOMMENDED PROCEDURE Nƕ Ĭ Ƭ Ǎdž!ƒ CƒƧɳÚƒ

ȟ18 ǩǟ ǟƬǟɳ ŌõȾ ɹǟş Ûɟǟǟǟɀ 5 öǟŌǫǫǟ ȷǫʌ .ǿǟǫǫnɾǟ Ƀᵾ Ž ȻŌǟǟè ŌŧĦǪÊŁ B gǺǵǟş Ġʌǿǽ ȸɳ ĞŧŁŸè ɹǟǟɀ ŌŧĦǪÊŁ Ōnǟǟ Ōɳ 0.5 ǟŁǿǟǟÆŌɳ ǿǟǫǫnɾǟ Ğ3ǟDZ ȸŌĦUŁ .gǟşǟɀǵǟ Ž ǩĦȾ zŁ ǟŧõ ǿǟǫǫnɾǟ gǟǟɳ ȸɳ ȯzŸǂǟ ǟRĦUŁ .ȟ 22Ş ÆĦǟ Ğ3ǟè 48 gÆɳ ĞǤǺǟǟƮǟ ŘƠ ɹǟǟǟǟǟ ŞǟHUŁ .ɹǟzǫ 5 gÆɳ ȸŌΣǟ ǟǟ8QÊʌ ÛĞÊǫǟDzǫɳ Ğ3ǟÊǟ ŸʌǾöǟ Æʌǿzöǟ Ž Æʌǿzöǟ .Ğ3ǟè 48 ȯŸn ğǟǫǟzΣǟ ȸɳ Ƀᵾ ŘŧʌB ǟæᵾ Ğùǟǟǟŧǟ ĠŁŧÊöǟ ȸɳ zŸ٦ǟ ğǟĠŸÛǫɳ ɟǫǟŧǟ ŸǤǟ .ȸŌΣǟ Ž ȻŌĞÊɳ ȳÆÁǫÊŁ Bş ȷŁŸè Ûǿuz 15 şᵾ 5 ȯǟŧǫǫè ǟ ÛĞǤǫǟǫ öǟǟDZqǟ ǟǟĦŁ ÛĞǤǺǟǟƮǟ gǟǫz ȯŸn ǩǟǫǟ şᵾ ǿǖz ğǟɳ ǟæᵾ ĠŁŧÊöǟ ȸɳ zŸ٦ǟ ğǟĠŸÛǫɳ ǿǟǫǫnɾǟ ŘƠ ţzȑzţǟ ɟǫǟŧǟ ɄøĠŸʌ .ȟ 20.5Ş ȟ19.5 ǩǟ ǟƬǟɳ ŌõȾ ɹǟş Ûǿǟǫǫnǟ Ƀᵾ .(Ğ3ǟè 48) ĞǤǺǟǟƮǟ gǟǫz ȯŸn ǟĦŁǟ ǿǟǫǫnɾǟ Ž ğǟǫǟzΣǟ ȸɳ Ƀᵾ ŘŧʌB ǟæᵾ Ğùǟǟǟŧǟ

TEST FOR PYROGENS ĂƉŽƉ‖ȼ l ȼǫ‖NjDŽ üŒŰ ƥƑĠĦƓƲȼ

zŁş .ĞʌşǟǪǫ ɄøʌŌΣǟ öǟÛ3qǟ 3Ǥǫʌ ɃØǟǟ ɃzŧŁΣǟ Ō3ǟǟǟǫǟǟ risk ǿǟÛǫǫnǟ ȸɳ ÆHUŸö ɔŧŁΣǟ ğǟǟÆǟzɳ ǿǟǫǫnǟ ŧŧƀ Ōɳ 10 ȸɳ Ğ3ǟDZ Ž ǿǟǫǫnɾǟ Æǫǟǿᵾ ŌĞę ȸɳ ĞŧŁHǫɳ ɹzȮǩ ɹᵾ ȸȮǂ Ʉøǫǟǟ ĞŸǟǟÊǟǟ ğǟDzǫǟŧǟ ŌDZj ȯǟŧǫǫÊŸö ÆÔŌŁ ğǟKRƠ ÆŸÛǫǩ Ʉøǫǟǟ ğǟDzǫǟŧǟ ŌDZj .Ęǟǟęǟ 4 ȸ3 Æʌǟǩ ɾ gǟǫz ȸŧɾȑ ɴnzŧ3 ÛɴʌÆʌǿǽş ĞǫzŌƬ ÛŷǟǟǫzŸŁõ 1 ŌȮö .gǟşǟɀǵǟ Ž gǟÛɴɳ ĞŁzǟɾȑᵾ ğǟǟǟɾǟ ǟǟ 3ǟɴ ɹᵾ ÆDzʌ ÛöǟÛ3qǟ ȸɳ Ğȯǟɾn ğɾɾΣ Ğɴȑǟɾǟ şᵾ ĞʌÆÆŸǫ

Test animal [illegible]

[illegible] ($\pm$2 [illegible]) [illegible] *ad libitum* [illegible] excite [illegible]

[illegible] 48 [illegible] 0.5 [illegible]

Temperature recording [illegible]

[illegible] 0.1 [illegible] temperature- [illegible] 6 [illegible] sensing device [illegible]

RECOMMENDED PROCEDURE [illegible]

[illegible]

30 [illegible] 40 [illegible] "[illegible]" [illegible]

1.0 [illegible] deviate [illegible] $\pm$0.2 [illegible]

39.8 … 38.0

250 … glassware …

38 … 30 …

1 … 10 … 3 … marginal …

4 …

30 … 3 …

0.6 …

1.4 …

1.4 … 0.6 …

8 … 3 … 5 …

3.7 … 0.6

TEST FOR HISTAMINE-LIKE SUBSTANCES (VASODEPRESSOR SUBSTANCES)

RECOMMENDED PROCEDURES

chloralose R …

barbiturate …

trachea …

carotid artery …

vagus nerve …

cannula … saline TS …

mercury manometer …

žÅĦĥ ƱHƱŸŋ òzŸHʊŧɛ̂ gözŸư ĞɛÆę ¢Ez ÕnÁɛ̂ĸş ĦɛǵäÀDZ ƁØÁÁàõä şÙ jugular ƱDZäåɛ̂ẓõä ÆʌØzẓõä Ƶ Î Ò ł .ȳÆõä Ù8Ŕõ .ÅTŸn dɒŋ øÅGQnʀä gåÅŋş ƙŋÅQÊɛTä ÕɛõÅŢ dɒÕHʊ̌ ɹÙ dɒÒŧł ƱøQõäş heparinized saline TS dɒʌøÅGɛTÅæ şÙ recording kymograph ȝƵŧʊõä ŕÅÛÁɑ̨ ÕɛDzÊk̆ ðÆæ ĻQʌ :ĞɛõÅQõä ĞÕʌÀÛõÅæ ƙŋÅQÊɛƵŸö ɹäzɛΣä ÈŁÊƠ dɒĦĦł .ȳÆõä Ù8Ŕõ ĞɛGÊʌõä ĞɛĶÅGǧõäş excursion dzzɛÊõä ƤÆŋ ÕDZɉ tracings ǧÅŧÊkÀɣ̈ä dɒʌÅĦĦĸş ĞðÅÎɳ ÕɛDzÊk̆ gÂɛƵDZ 0.1 Û(A Ğ3ÀƨäÀ) ȳäÀdqşÀÒɳ 0.05 dɒŋ ǧÅ3ÀX̌ ÛƁØÁÅɑ̨õä şÙ ƱDZäåɛ̂ẓõä ÆʌØzẓõä Ž TS ƙŋÅQÊɛTä òzŸŢ dɒŋ dɒÕHʊł ƙŋÅQÊɛTä âÅèŬ dɒŋ (C Ğ3ÀƨäÀ) ȳäÀdqşÀÒɳ 0.15ş – Õęɉä ƨŸ3 ǧäÀɳ ǫƳǫ øÀÒǩ – (B Ğ3ÀƨäÀ) ȳäÀdqşÀÒɳ gåẓ3 ÆĦæ ĞÕɛęå 1 ɒ3 ÕÕʌ ɾ Åɳ ÆĦæ ĞɛõÅQõäş ĞɛɑÅɣ̈õä dɒÕΣä ƨÛĦĸ .ɹäzɛΣä ɹàş dɒŋ ȳäÀdqzŸɛȭ 1 ÕÒõ histamine base ĞŸÊŸÊõä øÅGQ3ä ȳÆ3 3ɳ Û dɒÕΣä dɒŋ ĞŸÊŸÊõä ĆØŁ åÅĦĸ .ĘæÅÊõä dɒÕΣä ÕɆę gÀìÅGɳ ÕDzÊɰä ƨzǫÊɰä Бŭ ȳÆõä Ù8ř Æz .kɳÅQÊɛTä dɒŋ B Ğ3ÀƨäÀ ÆĦæ ȳÆõä Ù8ř Ž ĦɛGÊǫ Ágzɳ ɹÅÔÕǫ ƨŸ3 òzÔΣä ĻQʌ ƨøǫǵ Ûǧäõä ÅÔõä dɒŋ Ğɛõşɉä (ĘɆəà ĻŸɳ 20) òÅÒèÅæ zŸɛȭ 2.7 ɒ3 ÕÕʌ ɾ B Ğ3ÀƨäÀ ÆĦæ ɹÅÔÕʌõä ɹÅõ ääɛŭ ÙÕz øÅGQnʀä ÕDZɉ ɹäzɛΣä ȳÆÁǫÊł ɹÙ ǧÅæÅDzǫèä C Ğ3ÀƨäÀ ƱÛĦĸ Åɬʌɛæ B Ğ3ÀƨäÀ ǧÅæÅDzǫèä dɒŋ Ä8òŭ ǧÅæÅDzǫèä A Ğ3ÀƨäÀ ǨɆəè ääɛŭ ÛÕõɛ̆ dɒŋ Ä3ȭÙ Ûş .B Ğ3ÀƨäÀ ǧÅæÅDzǫèä dɒŋ ƎõŭŸ

ƨŸ3 ČŢzÅHʊŧŸö ČÛɛΣä Ʊnzǩ Æz ÛøÅGQnʀä gøşå ðÅÅǫŭ .gåşÀzǧä Ž ȣzòzɳ zŁ Åŧȭ øÅGQnʀä òzŸŢ ÀŘĦł Ʊnzǩ ĦŘʌŭ Æz ÛƱDZäåɛ̂ẓõä ÆʌØzẓõä ÕŧĦèä ääɛŭ .ƁøÅÊĦĜä òzŸ‡äş øÅGQnʀä òzŸŢ dɒŋ ÕÒõ dɒÕHʊŸö gÆǵzɳ Ğ3Àè ÅɳÆÅ3 .ȳÆõä Ù8ř ƨŸ3 ĻDzΣä øÅǫŭ ÆʌDzǫõ ĞʌşÅÊǫĦ ȳzDzШ ƙŋÅQÊɛTä ƁøÅÊĦĜşş øÅGQnʀä òzŸŢ dɒÕg ĻQʌ ɹüæ ĞÛɛΣä gÀìÅGɳ øÅGQnʀä òzŸŢş ƁøÅÊĦĜä dɒŋ ĞʌÕÕg Õõ ƷGŭĦ ɹŭ Æz ÛøÅGQnʀä ÕɛõÅŢş ƁøÅÊĦĜä ÕDZɉ ĞÕÀǫÎɳ ĞĦæ ȳÆÁǫÊł .ãzǫɉä dɒŋ ǧrÅŧŋ Ğʌŭ åÀÛõ saline TS ƱHʊŸä òzŸ‡ä dɒŋ ĦGʌÀÕĸ Õɳ 2.0 dɒÕШ

B ƤÀnlŭ Ğ3ÀDZ dɒÕHʊł ÓəÆÊĦæş øÅGQnʀä òzŸŢ dɒŋ kĦɳ øäÆÕɳ dɒÕШ Ğ3zǫǫɳ ƁøÅÊĦĜä òzŸŢ dɒŋ B Ğ3ÀƨäÀ dɒÕHʊł ÕƉDzÊɰä Ƥzǫɛ̂ẓä Бŭ ȳÆõä Ù8ř gåz3 dɒŋ ĞÕɛęå 1 dɒŋ Õęŭ ÆĦæ ÈŁõ ĞƷõÅƷõäş ĞɛɑÅɣ̈õä ɹÅQÅÕΣä ƨÛĦĸ .ƁøÅÊĦĜä òzŸŢ dɒŋ åÅĦĸ ÛA Ğ3ÀƨäÆæ ĦÅɑŭ ŘɛÛ3ĦŭŸ ƱøQõä ÕŸk dɒŋ ƎõŭŸ øÅGQnʀä òzŸ‡ ĞæÅDzǫèɾä ŘɑÅõ ääɛŭ .ĘæÅÊõä dɒÕΣä ÕɆę gÀìÅGɳ dɒŋ ƎõŭŸ C Ğ3ÀDzŸö ĞæÅDzǫèɾä dɒÒk B ääɛş .ƁøÅÊĦĜä òzŸŢ dɒŋ C Ğ3ÀƨäÀ ðÅÛ3ɯæ øÅGQnʀä ƨƵʌş ƙkÅɳ dɒÕΣä ČŸÊŸè .ĦŸùÅæ øÅGQnʀä ɑ̨ÉĦĸ ÛB Ğ3ÀDzŸö ƱøQõä ÕŸk ¢ʌÕǵ ɹÙ (*a*) ŕÀÎäş ƙŋÅQÊɛTä ÆɛDzǫÊʌş òzÕĦɳ ÕÒÎæ ĦQæÅǫ ÅɛęÅæ ȳäåÅɳ øÅGQnʀä Ž ɹäzɛΣä ȳÆÁǫÊł ɹÙ dɒŧł ĞæÅDzǫèɾä ĠɆÔk ɾ ɹÙ (*b*)ş C Ğ3ÀƨäÀ dɒŋ ŘǫÆǵĦŭ ƱøQõä ÕŸk dɒŋ ƎõŭŸ ĞŘzåɲ ĞæÅDzǫèä ÆɆĞk B øÅGQnʀä gåÅɳ dɒŋ .ĦÅǫŭ ĞǫzÕ‡ä B Ğ3ÀDzŸö ĞæÅDzǫèɾä Ùèzǫɳ dɒŋ ƨøǫåŭ øÅGQnʀä gåÅɳ ðÅÛ3ŭ ÆĦæ gÂÛĦĸ ƁøÅÊĦĜä òzŸŢ dɒŋ C Ğ3ÀDzŸö Ä8òŭ gåşÀzǧä Ž ĞʌÊĦĜä ĞɛŧÒõä dɒŋ dɒÕΣä ÆĦæ ǧÅæÅDzǫèɾä Ùèzǫɳ şÙ ĞæÅDzǫèɾä ŘɑÅõ ääɛŭ øÅGQnʀä gåÅɣ̈ä àÅǫΘ dɒŋ ŋŸȭ 1 ÕÒõ ƙŋÅQÊɛTä âÅèŬ dɒŋ ȳäÀdqşÀÒɳ 0.1) ƁøÅÊĦĜä òzŸ‡ä dɒŋ B Ğ3ÀDzŸö ĞÕzäzɣ̈ä ǧÅæÅDzǫèɾä Ùèzǫɳ dɒŋ

ȯzŸʈ ȸȵ C Ǧʒ Ȁ ƨ ä ȸȵ ƎõÜ ǦȒzȦǹ ǦæȦDzϘȅä øȦGϘǹɍä ȯzŸʈ ȸȵ ǥÆǵäȘ ǦʌåȀz ǦʒȀDZ ǦʌÜ ϙÆHȗǨ ɍȘ Û(ȷäzɆΣä ȷȁȘ
.(ȷäzɆΣä ȷȁȘ ȸȵ ŊŸõ 1 ȰȮö ƙȵȦϘÊɆTä âȦȅÜ ȸȵ ȳäȀȡȘȀȮȵ 0.15) ɃóȦÆȞȶä

METHODS OF PHARMACOGNOSY ꞵĭꞕꟻƭy⁄‖ɛ !ǂϒ 5ꞵƯ

[illegible]

DETERMINATION OF ASH AND ACID-INSOLUBLE ASH

RECOMMENDED PROCEDURES [illegible]

Determination of ash [illegible]

[illegible]

Determination of acid-insoluble ash [illegible]

[illegible]

MISCELLANEOUS l ƒYNjdžHDŽ

[illegible]

INTERNATIONAL CHEMICAL REFERENCE SUBSTANCES

[illegible]

[illegible]

- [illegible] infrared spectrophotometry [illegible]
- ultraviolet absorbtion [illegible] spectrophotometry
- [illegible]
- [illegible]
- [illegible] (automated [illegible]) [illegible]
- [illegible] gravimetric [illegible] titrimetric [illegible] non-stoichiometric [illegible]
- [illegible] optical rotation [illegible]
- [illegible] polarography [illegible]
- [illegible] fluorescence spectrophotometry [illegible]
- [illegible] microbiological assay [illegible] (151-145 [illegible])

[illegible] WHO Expert Committee [illegible]

[illegible] (1975 [illegible] 567 [illegible]).

[illegible] *International Pharmacopoeia* [illegible].

[illegible] WHO Collaborating Centre for Chemical Reference Substances [illegible] Solna [illegible] Sweden.

[illegible]

[illegible] Apotekens Centrallaboratorium [illegible] 3045 [illegible] 171 03 [illegible] 3 [illegible] Sweden. [illegible] package [illegible]

[illegible]

[illegible]

NAMES, SYMBOLS, AND RELATIVE ATOMIC MASSES OF CERTAIN ELEMENTS

[illegible] isotope ^{12}C [illegible] 12 [illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
58.93	Co	Cobalt [illegible]	26.98	Al	Aluminium [illegible]
63.55	Cu	Copper [illegible]	121.75	Sb	Antimony [illegible]
19.00	F	Fluorine [illegible]	74.92	As	Arsenic ([illegible]) [illegible]
197.0	Au	Gold [illegible]	137.3	Ba	Barium [illegible]
4.003	He	Helium [illegible]	209.0	Bi	Bismuth [illegible]
164.9	Ho	Holmium [illegible]	10.81	B	Boron [illegible]
1.008	H	Hydrogen [illegible]	79.90	Br	Bromine [illegible]
126.9	I	Iodine [illegible]	112.4	Cd	Cadmium [illegible]
55.85	Fe	Iron [illegible]	40.08	Ca	Calcium [illegible]
138.9	La	Lanthanum [illegible]	12.01	C	Carbon [illegible]
207.2	Pb	Lead [illegible]	140.1	Ce	Cerium [illegible]
6.941	Li	Lithium [illegible]	35.45	Cl	Chlorine [illegible]
24.31	Mg	Magnesium [illegible]	52.00	Cr	Chromium [illegible]

[illegible] 1± [illegible] 3± [illegible]

107.9	Ag	Silver	54.94	Mn	Manganese
22.99	Na	Sodium	200.6	Hg	Mercury
87.62	Sr	Strontium	95.94	Mo	Molybdenum
32.06	S	Sulfur	58.71	Ni	Nickel
232.0	Th	Thorium	14.01	N	Nitrogen
118.7	Sn	Tin	16.00	O	Oxygen
47.90	Ti	Titanium	30.97	P	Phosphorus
183.85	W	Tungsten (Wolfram)	195.1	Pt	Platinum
238.0	U	Uranium	39.10	K	Potassium
50.94	V	Vanadium	101.1	Ru	Ruthenium
65.38	Zn	Zinc	78.96	Se	Selenium
91.22	Zr	Zirconium	28.09	Si	Silicon

sulfur strontium lead calcium

significant figure

LIST OF REAGENTS, TEST SOLUTIONS, AND VOLUMETRIC SOLUTIONS

International Pharmacopoeia (SI)

Specifications for reagents mentioned *БşÆǖ Ğŀşåɉ ǿζ℮èå Ž ǥǿζÕǾţ Ζ ì ǿ ğÅÖ ζŋ* Б SRIP ʒDZÀţ ĞŸŧĤÊţ ğÆŧÊ ĶÛʒ Æęş .(1963 Û ΖÆDZ ÛĞţÀĤ ĞĦÔ ĞŧŢÀŋ) *in the International Pharmacopoeia* ǥǿÀǵ ĞDZǿå Ž öζΤ Ž âÆÖ ÛɃ Û d_{20}^{20} ĞÊÀ ĞζÀÕ ʔŸʒ *d* ĞŧÊ ȯÆ .ƙĦÀŋ ƙèζę ƙ SRIP Ž ÕÀè .°ÿ 20 ǥǿÀǵ ĞDZǿÆ öÀţ Б ĞÊ °ÿ 20

,3.0 öÀŁÀ şǽ Ğǝǿå ǰÀŋ ,**(Acetate buffer, pH 3.0, TS) TS** Û**3.0** öÀŁÀ Û ğÀÆèɉ Ğǝǿå glacial ɄDZŸʒ ÕÆèɉ Ȑƥ ȸ Ōŋ 6 ȣÀȒł ÛöÀţ Ž R ÿζåζÔ ğÀÆè ȯζŸŢ ȸ ȟ 12 âǾł .*öÀDZɋ* acetic acid R ΖÀÁŀş öÆŌŋ ǿÆŌŋ ȣÀÕ ȸ öÀţ ʒÀɋ 100 Ōŋ.

d~1048 Ü(25 ĞĦÀÔ Û1963 ÛSRIP) $C_2H_4O_2$ **.Acetic acid, glacial, R** ÛɄDZŸʒ ÛÕÆèɉ Ȑƥ ǯÂɀ :БÀ ǿÀnɍ ɄøĞł ɃØ R ɄDZŸʒ ÕÆèɉ Ȑƥ ,**Acetic acid, glacial, R1** ÛɄDZŸʒ ÛÕÆèɉ Ȑƥ ȯζŸŢ ȸ Ōŋ 1 ȣÀȒł Û°ÿ 20 Б åƎł ÛTS (ȯ/ȟ 1760~) ÕÀǿζÀŸÊ Ȑƥ ȯζŸŢ ȸ Ōŋ 10 ʒŋ ȟ 10.0 ȣÀȒł .ĞÕęå 30 ǥÆŋ ÆÕƘ ÕÀş Û VS(ȯ/ȯζŋ 0.0167) potassium dichromate ÿζèÀζĞ ğÀŋşÀÕ ɄǝÀ (ȯ/ȟ 80) potassium iodide ÿζèÀζĞ ÆÀåζ ȯζŸŢ ȸ Ōŋ 1.5 ȣÀȒłş Û°ÿ 20 Б åÀł ÛöÀţ ȸ Ōŋ 50 ȯÀŧĤèÀ Û VS (ȯ/ȯζŋ 0.1) sodium thiosulfate ÿζåζÔ ğÀŸèζ ȯζŸĦŧê ǿÀĦţ åζ ÀÀĤłş ÛTS .VS (ȯ/ȯζŋ 0.1) ÿζåζÔ ğÀŸèζ ȯζŸŢ ȸ Ōŋ 0.6 ȸ Ōę ÆŸÛ ɍ .ÀĤÎŧÕ ÀÎÀ ȯζŸŢ

300 ĞÀÀ ɃζƷ R ɄDZŸʒ ÕÆèɉ Ȑƥ ȸ ȯζŸŢ ζŁ ,**TS ȯ ȟ 300~ Acetic acid** ÕÆèɉ Ȑƥ ȯζŸŢ ȸ ȯ/ȟ $C_2H_4O_2$ 5) ȯ/ȯζŋ 5) Ü(ÀĞÀÕ .*d*~1.037

Û**TS ȯ ȟ 300~** ÕÆèɉ Ȑƥ ȯζŸŢ ȸ ȯζŸŢ ζŁ ,**TS ȯ ȟ 60~ Acetic acid** ÕÆèɉ Ȑƥ ȯζŸŢ ΖÀÁţ ĞÀÀ ɃζĦ 60 ȯ/ȟ ȸ $C_2H_4O_2$ (1 ȯ/ȯζŋ Ü(ÀĞÀÕ .*d*~1.008

TS (ȯ/ȟ 60~) ÕÆèɉ Ȑƥ ȯζŸŢ ȸ ȯζŸŢ ζŁ ,**PbTS ȯ ȟ 60~ Acetic acid** ÕÆèɉ Ȑƥ ȯζŸŢ ʔŸʒ ÀĞÀÕ ȣÀƨ ʔøǵ TS (ȯ/ȟ 60~) ÕÆèɉ Ȑƥ ȯζŸŢ ȸ Ōŋ 20 ÀÁł :БÀ ǿÀnɍ ɄøĞł ɃØ (ğÂŸÀ) ɈåĤţ åşÆǵ .ĞŸÕʒ (ğÂŸÀ) ɈåĤţ ÕDZɉ ǿÀnɍ ĘÛłş öÀţ ȸ Ōŋ 25 ȣÀȒł ÛɄǝŋ ÿÀƥ ĞŸÕʒ ɄŁ 3 Ōŋ/ÿÀɖşÀÒŋ.

.(26 ĞĦÀÔ Û1963 ÛSRIP) $C_4H_6O_3$ **.Acetic anhydride R** ÕÆèɉ ÆÀǿÆŒ

.(27 ĞĦÀÔ Û1963 ÛSRIP) C_3H_6O **.Acetone R** ɈζÆèɉ

.C_2H_3N ÛMethyl cyanide ÕÆʒţ ÆÀè **.Acetonitrile R** ÕÀÆζÆèɉ

.¢ ɈζΓɍ ÛĘǝǿ ÕǝÀè :*Ζöζ*

.ŏÅţă 3ƞ ǦÅÀШ ǯÂǬƹ :*miscibility ǦƩǋşÂţă*

.**TS ὁ ȟ 400 Acetonitrile** ǑÅÀǬƩǬǫǬȅɉă

ȸƞ ὁ/ȟ 400 ǦäăÀǉ ǰǨÅÂöă ὁǫŸǂă Ƀǫʒ .ŏÅţă ȸƞ ÅɫǅǵǴ1 3ƞ R ǑÅÀǬǫǬȅɉă ȸƞ ÅɫǅǵǴ 1 ǯÂɫɫ :*ŏäÀǅǫǭă*

.C_2H_3N

.(27 ǦĦÅÔöă Û1963 ÛSRIP) .**Agar R** øÅȡǿă ŏäÀȡ

.ȼÅɫɫƞ $Al(OH)_3$.**Aluminium hydroxide R** ÿǫƩÅƩƞǫǒɉă ǼƩÊÕşøǼƩȽ

.ǦĦəäÀöă ȻǼȝ Ûɉǫŷöă ȀƩäÛ ȧǫĦÊƞ :*ǫöǫöă*

.TS (ὁ/ȟ 750~) ὁǫǬǰÅǭă ὁǫŸȚ Ž ɍş ŏÅţă Ž ÅƩŸɫȝ ăäşǽ Ƙȡ :*ǦƩǬÅşǾöă*

.d~ 0.894 Ü(31 ǦĦÅÔöă Û1963 ÛSRIP) . R ÛÂȭÀɧ ÛÅƩǬǫƞÛ **TS ὁ ȟ 260~ Ammonia** ÅƩǬǫƞɉă ὁǫŸȚ

ȸƞ ὁ/ȟ100 ǦäăÀǉ ɃǫĦƩö ǫäÅɫ ÛTS (ὁ/ȟ 260~) ÅƩǬǫƞÛ ὁǫŸȚ .**TS ὁ ȟ 100~ Ammonia** ÅƩǬǫƞɉă ὁǫŸȚ

. d~0.956 Ü(ÅǦÅÀÕǨ ὁ/ὁǫƞ 6) NH_3

ÀÅǼǦɫ :ƃÅǬöă øÅǦǬǹɍă ɄøǦŸɫ ɃǾöă TS (ὁ/ȟ 100~) ÅƩǬǫƞÛ ὁǫŸȚ .**FeTS ὁ ȟ 100~ Ammonia** ÅƩǬǫƞɉă ὁǫŸȚ

ὁǫŸȚ ȸƞ Ōƞ 2ş ÛŏÅţă ȸƞ Ōƞ 40 ȣÅȒɫ ÛɄəÅƞ ÿÅþ ʔŸȝ ÅǦÅÀÕǨ TS (ὁ/ȟ 100~) ÅƩǬǫƞɉă ὁǫŸȚ ȸƞ Ōƞ 5

Ûmercaptoacetic acid R ŌƩǬƩȅÛǫǬäÅŏƘţă Ȁþ ȸƞ ɉÅǨÀÛęş FeTS (ὁ/ȟ 180) citric acid ŌÅÀǬƩÊöă Ȁþ

.ɄŸÅǬÀę ɉǫǒ ɃÛ ǰǬÅÅ ɍ ÜŏÅţÅǽ Ōƞ 50 ƃÛ ǫäÅɫş ÛFeTS (ὁ/ȟ 100~) ÅƩǬǫƞɉă ὁǫŸĦɫȩ ÅÅǫŸę ŎĤǅɫ ÛǯÂɫɫ

:ƃÅǬöă øÅǦǬǹɍă ɄøǦŸɫ ɃǾöă TS (ὁ/ȟ 100~) ÅƩǬǫƞÛ ὁǫŸȚ .**PbTS ὁ ȟ 100~ Ammonia** ÅƩǬǫƞɉă ὁǫŸȚ

ὁǫŸȚ ȸƞ Ōƞ 1 ǦöÅɫǰöă ƃÛ ȣÅȒɫ ÛɄəÅƞ ÿÅþ ʔŸȝ ȣÅÅƨă ƃÛ TS (ὁ/ȟ 100~) ÅƩǬǫƞɉă ὁǫŸȚ ȸƞ Ōƞ 5 ÀÅǼǦɫ

60~) ŌƩǬƩȅɉă Ȁþ ȸƞ Ōƞ 2 Ž ǦöÅɫǰöă ăäǾɫ .ȣÅÅƨă ƃÛ ÀÅǼɫş ÛTS (ὁ/ȟ 70~) ŌÅǿǫŸÕşøǼƩȚă Ȁþ

ǦŌÅÀÛǽ ǼȽÅÎöă ÀȒĦɫ .ǦŸƩŌǯöă (ğăÂŸÀöă) ɉǻÅĦţă ŎǅǫɉøÅǦǬǹɍă ĘǦÛɫş Ōƞ 25 ƃÛ ŏÅţÅǽ ǫäÅɫ ÛPbTS (ὁ/ȟ

.Ōƞ/ÿăÀȡşÀŌƞ 2 ɄȽ ǦŸƩŌǯöă (ğăÂŸÀöă) ɉǻÅĦţă ǻşǼǵ .ǦŏÅÎɧ

،**Ammonia buffer TS** ÅƩǬǫƞɉă Ǧəøăǻ ὁǫŸȚ

ŏÅţÅǽ ǫäÅɫş TS (ὁ/ȟ 260~) ÅƩǬǫƞɉă ὁǫŸȚ ȸƞ Ōƞ 570 Ž R ÅƩǬǫƞɉă ǼÅǿǫŸÕ ȸƞ ȟ 67.5 ăäǾɫ .*ŏäÀǅǫǭă*

.Ōƞ 1000 ƃÛ

.(32 ǦĦÅÔöă Û1963 ÛSRIP) $C_2H_7NO_2$ ،**Ammonium acetate R** ÿǫƩǬǫƞɉă ğÅǬƩȅÛ

ǦäăÀǉ ɃşÅƩă R ÅƩǬǫƞɉă ğÅǬƩȅÛ ȸƞ ὁǫŸȚ ǫȽ ،**TS ὁ ȟ 80 Ammonium acetate** ÿǫƩǬǫƞɉă ğÅǬƩȅÛ ὁǫŸȚ

.(ÅǦÅÀÕǨ ὁ/ὁǫƞ 1) $C_2H_7NO_2$ ȸƞ ὁ/ȟ 77

[illegible] **Ammonium carbonate R**، $NH_4\ _2CO_3$ (SRIP 1963 [illegible] 33).

[illegible] **Ammonium chloride R**، NH_4Cl (SRIP 1963 [illegible] 33).

[illegible] **Ammonium chloride TS**، ([illegible] 10 [illegible] NH_4).

[illegible] 0.296 [illegible] R [illegible] 1000 [illegible].
[illegible] 10 [illegible] 100 [illegible].
Shelf - life [illegible] 2 [illegible].

[illegible] **Ammonium chloride buffer TS 10.0** [illegible] 10.0.
[illegible] 7.0 [illegible] R [illegible] 57 [illegible] (~260 [illegible]) TS [illegible]
[illegible] 100 [illegible].

[illegible] **Ammonium molybdate R** $(NH_4)_6\ Mo_7O_{24},4H_2O$ (SRIP 1963 [illegible] 34).
[illegible] **Ammonium molybdate 95** [illegible] **TS.** [illegible] R [illegible]
95 [illegible] $(NH_4)_6\ Mo_7O_{24}$.

[illegible] **Ammonium oxalate R**، $C_2H_8N_2O_4,\ H_2O$ (SRIP 1963 [illegible] 36).
[illegible] **Ammonium oxalate 25** [illegible] **TS.** [illegible] R [illegible]
27 [illegible] $C_2H_8N_2O_4$.

[illegible] **Ammonium thiocyanate R**، NH_4SCN (SRIP 1963 [illegible] 36).
[illegible] **Ammonium thiocyanate 75** [illegible] **TS**، [illegible]
75 [illegible] NH_4SCN ([illegible] 1 [illegible]).

[illegible] **Ammonium thiocyanate 0.1** [illegible] **VS.** [illegible] R [illegible]
[illegible] 7.612 [illegible] NH_4SCN [illegible] 1000 [illegible].

standardization [illegible] 0.1 [illegible]:
[illegible] 30.0 [illegible] (0.1 [illegible]) VS [illegible] 50 [illegible] (~1000 [illegible]) TS [illegible] 2 [illegible] 45) [illegible] 2 [illegible]
TS ([illegible].

[illegible] **Ammonium thiocyanate (0.01** [illegible]) **VS.** [illegible] R [illegible]

.Ōŋ 1000 Ž NH_4SCN ȡŋ ȟ 0.7612 ɿŸȝ ɃǫǪHJǷō ŏǺţǟ

ȯǫŸȚ ȷǟǫǺȝ ǨƠ Ǧǫǫȍǫţǟ ǦŌǺǞǛǠǟ ȯǫŸHɫŸō ĘǷęǼōǟ ǞǷȭǞǪōǟ ȡŋ ĘŌHǪōǟ ɭǪǺ .*standardization* *ȄǷŌǪōǟ ǦŌǺǞü*

.VS (ȯ/ȯǫŋ 0.1) ӯǫǷǭǫŋɉǟ ğǞǷȅǫǷǭ

،$C_4H_4NaO_7Sb$ ،**Antimony sodium tartarate R** ȷǫɫǷǪɉǟş ӯǫǺǻǫÔōǟ ğǟǞüǞü

.ȒǷɉǟ ƂǗ ǟøǞȓ şǗ ȣǞǞȉ Ûhygroscopic ǼȗǞǪÊɦ ȧǫHÊŋ şǗ scales ȤȉǟǞǵ :*Ȥȍǫōǟ*

.TS (ȯ/ȟ 710~) ȯǫǷǞǯǞqǟ Ž ǷǷŸɫȝ ǟǟşǽ Ƙȡ ÜŏǺţǟ ȡŋ ǷȍÂDZ 1.5 Ž ǟǟşǽ :*ǦǷǷǟşØōǟ*

ӯǫǺǻǫÔōǟ ğǟǞüǞü ȯǫŸȚ .**TS** ȯ ȟ**50** **Antimony sodium tartarate** ȷǫɫǷǪɉǟş ӯǫǺǻǫÔōǟ ğǟǞüǞü ȯǫŸȚ

.$C_4H_4NaO_7Sb$ ȡŋ ȯ/ȟ 50 ǦǟǟǞǷ ɿŸȝ ɃşǞΣǟ R ӯǫǷǭǫŋɉǟş

ȡŋ ӯǟǞȡşǞȮŋ 10 ɿŸȝ Ƀǫǫȝ ǞǪō ɄŸǷŋ ǼǵǟşŌõ ،**AsTS** ÛȤǞǞǺţǟ Û**Arsenic** ȠǷǷøÂōǟ ȬǷǷȅøɉǟ ȯǫŸȚ

.ȬǷǷȅøɉǟ

.Ōŋ 100 ȝǞǪǫq ŏǺţǟ ȡŋ ǟȣǞȭ øǟǼŌŋ AsTS ǞȭǞţǟ (ȠǷǷøÂōǟ) ȬǷǷȅøɉǟ ȯǫŸȚ ȡŋ Ōŋ 1 ȤǞǺɫ :*ŏǟǞDZqǟ*

.ƘȒHJǪōǟ ȝǟǞü AsTS ȬǷǷȅøɉǟ ȯǫŸȚ ȷǫȮǺ ȷǗ Ǽƶ :*ǦȚǵŸŋ*

،**AsTS** ÛǞȭǞţǟ Û**Arsenic** ȠǷǷøÂōǟ ȬǷǷȅøɉǟ ȯǫŸȚ

ӯǫǺǻǫÔōǟ ǼǷÊȭşøǼǷȽ ȯǫŸȚ ȡŋ Ōŋ 6 Ž R (ȠǷǷøÂōǟ) ȬǷǷȅøɉǟ ǼǷÊȭǞ ɄǫŸǷ ȡŋ ȟ 0.132 ǟǟØɫ :*ŏǟǞDZqǟ*

ȣǞȒɫş ÛŏǺţǟ ȡŋ Ōŋ 20 øǟǼŌŋ ǻǞǞţǟ ȯǫŸɨǟ ȤǞǺɫ .ȤǷǞȉǟ ƘǺÊǪǞǠ ÛTS (ȯ/ȟ 80~) sodium hydroxide

.Ōŋ 100 ȝǞǪǫq ŏǺţǟ ȡŋ ȣǞȭ øǟǼŌŋş TS (ȯ/ȟ 250~) ȬǞøǫŸȭşøǼȚǟ Ȓƥ ȯǫŸȚ ȡŋ Ōŋ 50

.(44 ǦHJǞÔōǟ Û1963 ÛSRIP) As_2O_3 ،**Arsenic trioxide R** ȬǷǷȅøɉǟ ǼǷÊȭǞ ɄǫŸǷ

.(45 ǦHJǞÔōǟ Û1963 ÛSRIP) $BaCl_2, 2H_2O$ ،**Barium chloride R** ӯǫǞøǞǦōǟ ǼǞøǫŸȭ

ȡŋ ȯ/ȟ 52 ǦǟǟǞǷ ɃşǞΣǟ R ӯǫǞøǞǦōǟ ǼǞøǫŸȭ ȡŋ ȯǫŸȚ ،**TS** ȯ ȟ**50** **Barium chloride** ӯǫǞøǞǦōǟ ǼǞøǫŸȭ ȯǫŸȚ

.(ȯ/ȯǫŋ 0.25 ǟøǞȬɫ Ǟŋ) $BaCl_2$

ɿŸȝ ɃǫǪHJǷō ŏǺţǟ Ž ǟǟØɦ ÛR ӯǫǞøǞǦōǟ ǼǞøǫŸȭ ،**VS** ȯ ȯǫŋ **0.5** **Barium chloride** ӯǫǞøǞǦōǟ ǼǞøǫŸȭ ȯǫŸȚ

.Ōŋ 1000 Ž $BaCl_2$ ȡŋ ȟ 104.2

Ȝȑǫɫ :ǦǷǞǪōǟ ǦŌǺǞǛǠǟ ȯ/ȯǫŋ 0.5 ȯǫŸHɫŸō ĘǷęǼōǟ ǞǷȭǞǪōǟ ȡŋ ĘŌHǪōǟ ɭǪǺ .*standardization* *ȄǷŌǪōǟ ǦŌǺǞü*

ȣǞȒɫ ÛŏǺţǟ ȡŋ Ōŋ 40 øǟǼŌŋ ȤǞǺɫ ÛǦŸDZǫǵ Ž VS (ȯ/ȯǫŋ 0.5) ȬǞøǫǞŸÊōǟ Ȓƥ ȯǫŸȚ ȡŋ Ōŋ 10.0

ǟøǞȒōǟ ȷǫŸōǟ ɿøǪǵ ӯǫǞøǞǦōǟ ǼǞøǫŸȭ ȯǫŸHɫÊ ŏȔǦǽ ǞǞǞȞɫş Û TS (ȯ/ȟ 2) thorin ȡǞøǫǯōǟ ȯǫŸȚ ȡŋ ȷǞǨǞÛę

.Ǟƥɉǟ ƂǗ

.(47 [illegible] 1963 [illegible] SRIP) $Ba(NO_3)_2$.**Barium nitrate R** [illegible]

[illegible] 2.614 [illegible] R [illegible] .VS [illegible] **0.01** **Barium nitrate** [illegible]
.[illegible] 1000 [illegible] $Ba(NO_3)_2$ [illegible]

[illegible] 0.01 [illegible] .*standardization* [illegible]
[illegible] 40 [illegible] VS ([illegible] 0.01) [illegible] 10.0
methylthioninium [illegible] TS ([illegible]2) thorin [illegible]
.[illegible] TS ([illegible] 0.2) chloride

Barium oxide R [illegible] **،BaO** ،
[illegible] .*[illegible]*
.[illegible]

.[illegible] .*[illegible]*

Barium sulfate suspension TS [illegible] ،
[illegible] 20[illegible] 55 [illegible] VS ([illegible] 0.5) [illegible] 15 [illegible] .*[illegible]*
TS ([illegible] 174) [illegible] 5 [illegible] TS ([illegible] 750~) [illegible]
.[illegible] 100 [illegible]

.[illegible] TS [illegible] .*[illegible]*

[illegible] ،**Beef extract R** [illegible]
[illegible] ([illegible]) [illegible]
.[illegible]

[illegible] %96.0 [illegible] .$C_{16}H_{17}N_2NaO_4S$ ،**Benzylpenicillin sodium R** [illegible]
.[illegible] $C_{16}H_{17}NaO_4S$ [illegible] %102.0 [illegible]
.[illegible] .*[illegible]*
.R [illegible] R [illegible] 0.5 [illegible] .*[illegible]*

Benzylpenicillin sodium TS [illegible]
[illegible] R [illegible] 0.03 [illegible] .*[illegible]*
.R [illegible] 3 [illegible] .[illegible] 10 [illegible] TS [illegible]7.0

،H_3BO_3 [illegible] %99.0 [illegible] ،H_3BO_3 ،**Boric acid R** [illegible]

.ȷǫŸöä ȒĦǚ ɃǿǫŸæ ȧǫĦÊŋ şǚ Åŋ ÅʒǫƍǤʒÅţ ǦƖǘöǘö Ǭ ȉäÀǵ şǚ ȷǫŸöä öÅȒĦæ ğäǿǫŸæ . *Ǭ ȍǫöä*

750~) ȯǫƍÅǯƖɋä ȯǫŸƮ ȡŋ ŏÂDZ 16 Žş ÛƃÅ8öä ŏÅţä ȡŋ ŏäÂDZǚ 3 Žş ÛöÅţä ȡŋ ȁöÂDZ 20 Ž āşǾƖ *.ǦƍÅæşǾöä*

.TS (ȯ/ȟ

.ȷǫö Ÿæş ȀÕəäǿ ȯǫŸǂä ȷǫȮƖ ÜöÅţä ȡŋ ȁöÂDZ 30 Ž ȟ 1.0 āäǾƚ *.öÅţä Ž ǦæşǾöä Ƙȡ åǫţä*

ȷǫȮƖ ÜTS (ȯ/ȟ 750~) ƃÅ8öä ȯǫƍÅǯƖɋä ȯǫŸƮ ȡŋ Ōŋ 10 Ž ȟ 1.0 āäǾƚ *.ȯǫƍÅǯƖɋä Ž ǦæşǾöä Ƙȡ åǫţä*

.Àǯõǚ ɍ ǬĦȑ ŌȮÎæ ȀÀȮʒ ȯǫŸǂä

ÛR ȯşƘÊĦŸ8öä ȡŋ Ōŋ 50 8ÅȒƚş ÜöÅţä ȡŋ Ōŋ 30 Ž ÛǦĦùǫǦȒŋ Ǧƍşàǫŋ Ûȟ1 ǦæäÀȩ āäǾƚ *.assay ǦÊƖÅŌţä*

ȡŋ ƃÅʅä ÿǫƖåǫÔöä ǼĦÊõşǿǼĦȽ ȯǫŸĦʈÊ ÀƖÅȟƚş ÛTS ȯǫƍÅǯƖɋä/ƙÅöÅǯǫ ȯǫǼÅöä ȯǫŸƮ ʔŸʒ ȀÕǦÊŋ ȯǼȟƍÊţä

ȯǫŸƮ ȡŋ Ōŋ 1 Ōõ .ÀȟÎʈõ TS ȯǫƍÅǯƖɋä/ƙÅöÅǯǫ ȯǫǼÅöä ȯǫŸƮ ȯÅʈȟƍèÅæ ÛVS (ȯ/ȯǫŋ 1) ğÅƍǫæÀȮöä

.H_3BO_3 ȡŋ ŊŸŋ 61.83 ȕǫÅȮƚ VS (ȯ/ȯǫŋ 1) ğÅƍǫæÀȮöä ȡŋ ƃÅʅä ÿǫƖåǫÔöä ǼĦÊõşǿǼĦȽ

.H_3BO_3 ȡŋ ȯ/ȟ 50 ǦæäÀȩ ʔŸʒ ɃşÅΣä R ǿǫǦöä ȒʈΣ ȯǫŸƮ ،**TS ȯ ȟ 50 Boric acid** ǿǫǦöä Ȓƥ ȯǫŸƮ

.(51 ǦĦÅÔöä Û1963 ÛSRIP) Br_2 ،**Bromine R** ÿşƎöä

،R ÿşƎöä ȡŋ ʒǦÎȟ ȯǫŸƮ ،**Bromine TS1** ÿşƎöä ȯǫŸƮ

،**Bromine AsTS** ÿşƎöä ȯǫŸƮ

ǿäǼŌŋ ǬæÅǺƚş R ÿşƎöä ȡŋ ȟ 30 8ÅȒƚş ÛöÅţä ȡŋ Ōŋ 40 Ž R ÿǫĦèÅƙǫǦöä ǼĦŋşÀæ ȡŋ ȟ 30 āäǾƖ *.ŏäÂDZɋä*

ÿÅƥ ʔŸʒ ȀǦƖÀŌƙ 8ÅƖƨä ʔǿƍǵ Ōŋ 10 ÀǺƚ :ƃÅƍöä ǿÅǦƍȵɍä ɄǿǦŸƚ ȯǫŸǂä .Ōŋ 100 ǯÅƍƍɋ ŏÅţä ȡŋ 8Åõ

ȡŋ ȁ8Åõ ǿäǼŌŋş ÛAsTS (ȯ/ȟ 250~) ŌƖǿǫŸõşǿǼĦTä Ȓƥ ȯǫŸƮ ȡŋ Ōŋ 10 ÛöÅţä ȡŋ Ōŋ 50 8ÅȒƚ ÛɄəÅŋ

ŌDZɉ ÿÅȟöä ǿÅǦƍȵɍä ĘǦÛƚş ÛɄŌǦƍţä ÿşƎöä ȯäÂƍȵɍ stannous chloride AsTS ɃÀƖǼÔŌöä ǼƖǿǫŸõ ȯǫŸƮ

ÛɃǿÅĦȟȼä ȡŋ Ōŋ –1 ǦǺÛȹ ȡʒ ǰƙÅƖöä Ōöæ ȡŋ ǥǼȉ Àǯõǚ ǦƟÅƖöä ǦǺÛŸöä ȷǫö ȷǫȮƖ ɍ .(ȐĦƍǿÂöä) ŌĦǼèǿɉä

.Ōŋ/ÿäÀȡşÀȮŋ 1 ȡʒ ǼƖÂǨ ɍ ŌĦǼèǿɉä ǦĦʈõ ȷǚ ʔŸʒ ŌöǾæ ǥÀƮȚȟ

.(52 ǦĦÅÔöä Û1963 ÛSRIP) $C_{19}H_{10}Br_4O_5S$ ،**Bromophenol blue R** ȯǫǼǫǫŋşƎöä Ǧȩǿȃ

،**Bromophenol blue/ethanol TS** ȯǫƍÅǯƖɋä ȯǫǼǫǫŋşƎöä Ǧȩǿȃ ȯǫŸƮ

(ȯ/ȯǫŋ 0.05) ÿǫƖåǫÔöä ǼĦÊõşǿǼĦȽ ȯǫŸƮ ȡŋ Ōŋ 3.2 ʒŋ R ȯǫʈĦƍǫŋşƎöä Ǧȩǿȃ ȡŋ ȟ 0.1 ȡÅǺÊƚ *.ŏäÂDZɋä*

ȯǫŸƮ ȡŋ ǦĦǫÅõ ǦĦʈõ 8ÅȒƙ ÛȯǫŸǂä àÅƱǚ ȴƍƖ ȷǚ ǼȟæÜTS (ȯ/ȟ 710~) ȯǫƍÅǯƖɋä ȯǫŸƮ ȡŋ Ōŋ 5ş VS

.Ōŋ 250 ǯÅƍƍɋ (ȯ/ȟ 150~) ȯǫƍÅǯƖɋä

،**Brown stock standard TS** ɄǿǼǦöä ȡƖÂʅä ɃǿÅĦȟȼä ȯǫŸǂä

Ōŋ 0.8 ÛTS ȃÅĦƖöä ȷǫö ȯǫŸƮ ȡŋ Ōŋ 17.0 ǿäǼŌŋ TS ǨÅöæǫȮöä ȷǫö ȯǫŸƮ ȡŋ Ōŋ 35.0 ƃǚ 8ÅȒƚ *.ŏäÂDZɋä*

. ... 100.0 ... TS ...

.(56 ... 1963 SRIP) $CaCO_3$.**Calcium carbonate R1** ...

... R1 ... .$CaCO_3$.**Calcium carbonate R2** ...
.disodium edetate ...

1963 SRIP) $CaCl_2$. R ... **Calcium chloride, anhydrous,R** ...
.(58 ...

1963 SRIP) $CaCl_2, 6H_2O$.**Calcium chloride, hydrated, R** ...
(58 ...

... R ... .**TS** ... **55 Calcium chloride** ...
.(... 0.5 ...) $CaCl_2$ ... 55 ...

2-hydroxy-1-[(2-hydroxy-1-naphthyl)-azo] ... .**Calcon R** ...
... 15705 ... C.I. Mordant Black 17 ... C.I naphthalene-4-sulfonic acid
Solochrom Dark Blue ... Eriochrome Blue Black R ...
.$C_{20}H_{13}N_2NaO_5S$

2-Hydroxyl-1- (2-hydroxy-4-sulfo-1- .**Calcon carboxylic acid R** ...
.$C_{21}H_{14}N_2O_7S, 3H_2O$ naphthyl-azo) -3-naphtoic acid

... TS (... 750~) ... R ...
.alkali hydroxides ...

Calcon carboxylic acid indicator mixture R ...
.R ... 10 ... R ... 0.1 ...

.**R** ...
.R ... 10 ... R ... 0.1 ...

.**CO_2** .**Carbon dioxide R** ...

... 1.3 ...

.(62 ǴĤǺÔöä Û1963 ÛSRIP) CS_2 ،**Carbon disulfide R** ǰƺäÀÒöä ǼĪÄŸȅ ȾǝǺĀǬ

ƵĪù ɃǼǴł :ƃǺǪöä ǿǺǪǹɎä ȾøǴŸł ɃǾöä R ǰƺäÀÒöä ǼĪÄŸȅ ȾǝǺĀǬ .**Carbon disulfide IR** ǰƺäÀÒöä ǼĪÄŸȅ ȾǝǺĀǬ

ǰäƺǺʒ ǨƠ 4 ǴǬĀÛöä Ž ȣƺòƺŋ ƺĿ ǺȶÕ ÛĻŸŋ 1.0 ǴφǺǺ̌ǯä ǴÕǴÛö ǒäÀȶΣä ǨƠ ǴĤÌɉä ǴÕÛĀŋ Ž îǺÔǪŋɎä

cm^{-1} 670- 4000 òǺÕä Ž î ƺĤǺţäş Û(45 ǴĤǺÔöä ÀŢφä) "ǒäÀȶΣä ǨƠ ǴĤÌɉä ǴÕÛĀŋ Ž ȾǝƺŔöä ƵĪÛöä âǺĪȩ"

Ûcm^{-1} 935-1265ş Ûcm^{-1} 1755-2000 Ûcm^{-1} 2440 - 2635 Ûcm^{-1} 3030- 4000 òǺÕä Ž 0.1 ȸʒ ŌÕĀ ɎŘòǺǬ

.cm^{-1} 715 - 800 ǴÕÛĀŋ Ž 0.17 ȸʒ ŌÕĀ ɎŘòǺǬş

.(63 ǴĤǺÔöä Û1963 ÛSRIP) CCl_4 ،**Carbon tetrachloride R** ǰƺäÀǪöä ǼĀøƺŸÕ Ƀʒǻäø

،$Ce(NO_3)_4$, $2NH_4NO_3$ ،**Ceric ammonium nitrate R** ȳƺĀǨÊöäş ȳƺĪφƺŋɉä ǧäÀǪφ

.ƃǺŌǨƎöä ƃÛ āøǺȑ Àþ ǰƺŸä ǰŸĪţä ǴǺǺ́ǵǺ ǵǨȣò ǧäøƺŸä *.ƵòƺǾä*

.ǒǺţä Ž ŘǼDZ Ǵäšǻȩ *.ǴĪφǺşǾöä*

ÛTS (ò/ȟ 1760~) ŌĀøƺǺŸÊöä ȐþòƺŸŢ ȸŋ Ōŋ 10 ÛǴĪùƺǴȒŋ Ǵφşàƺŋ Ûȟ 5 ƃÛ ȣǺȒł *.Ǵäşǿöä Ǩȡ âǐƺţä*

ȾǝǺŋ ȳǺþ ʔŸʒ ʔÛȣŸŋ ȧøşǻ Ž ĻȒŢłş ǰǺĪŸȣöä ʔøǪǵ ȸǺǺÊł .ǰǺäşǾŸö ǒǺţä ȸŋ Ōŋ 90 øǾШ ȣǺȒłş ÛŌǺĤł

ǼĀÂĀ Ɏ .°ȳ 105 ǵøäÀǵ ǴDZøǻ Ž ƵǺDzłş ÛŌŋǺÕ ŌÒÎä ŌÊȣł ÛǴȡøǺƺ ǴĪÌÀǨ ǴŌǨƺä ƃÛ ǴĩÌÀł .Ǵʒǻȅ 1 ǵǼŋ

.ŊŸŋ 2.5 ȸʒ ǴǬǺȶǯöä ǰàş

òƺŸŢ ȸŋ Ōŋ 10 Ž ÛǴʒǺȅ 24 ǵǼŋ °ȳ 85 ǴDZøǼǬäǺä ƵĪǺDzǪöä ǴÕǴÊţäş ǴĪùƺǴȒŋ Ǵφşàƺŋ Ûȟ 2.5 āäǾł *.ǴÊĀǺŌţä*

ȡòşÀǯφǺĀĪƺ ƺǪøşǙ òƺŸŢ ȸŋ ǧäÀÛȩ ʒȒä ȣǺȒł .ǒǺţä ȸŋ Ōŋ 40 ȣǺȒłş TS (ò/ȟ 190~) ŌĀøƺǺŸÊöä Ȑþ

ȸŋ Ōŋ 1 ŌÕ .VS (ò/òƺŋ 0.1) ferrous sulfate àşǼĀǼΣä ǧǺĀŸȅ òƺŸĤȶȇ ÀĀǺȞłş *o*-phananthroline TS

.$Ce(NO_3)_4$, $2NH_4NO_3$ ȸŋ ŊŸŋ 54.8 ùƺǺÒĀ VS (ò/òƺŋ 0.1) àşǼĀǼΣä ǧǺĀŸȅ òƺŸŢ

،**Ceric ammonium nitrate TS** ȳƺĀǨÊöäş ȳƺĪφƺŋɉä ǧäÀǪφ òƺŸŢ

.TS (ò/ȟ 15) ŌĀÀǪȶöä Ȑþ òƺŸŢ ȸŋ Ōŋ 10 Ž R ȳƺĀǨÊöäş ȳƺĪφƺŋɉä ǧäÀǪφ ȸŋ ȟ 6.25 āäǾł *.ǒäǺDZǪä*

.ǨȒĤǪöä ȸŋ ȳǺǺ 3 òŸǹ ŌȶȞǪÊł *.ȸĀǺǺ́ǪöäǺȶʒ*

.(63 ǴĤǺÔöä Û1963 ÛSRIP) $Ce(SO_4)_2$, $4H_2O$ ȾĿ ǵǻǺʒ .**Ceric sulfate R** ȳƺĀǨÊöä ǧǺĀŸȅ

ò/ȟ 33 ǴäǺǺȩ ʔŸʒ ɃşǺΣä R ȳƺĀǨÊöä ǧǺĀŸȅ ȸŋ òƺŸŢ .**TS ò ȟ 35 Ceric sulfate** ȳƺĀǨÊöä ǧǺĀŸȅ òƺŸŢ

.$Ce(SO_4)_2$ ȸŋ

.(64 ǴĤǺÔöä Û1963 ÛSRIP) .**Charcoal R** ĻĤǺöä

.$C_8H_{11}C_3O_6$ ،**Chloralose R** àƺöäøƺŸÒöä

[illegible]

[illegible] 187 [illegible]

[illegible] *specific optical rotation* [illegible] 50 [illegible] (~750 [illegible]) TS [illegible]
$[\alpha]_D^{20^\circ C} = +19^\circ$.

[illegible] **Chlorine R**, Cl_2 (SRIP 1963 [illegible] 65).

[illegible] **Chlorine TS** [illegible] R [illegible]
[illegible] TS [illegible]

[illegible] **Chloroform R** $CHCl_3$ (SRIP 1963 [illegible] 66).

[illegible] **Citric acid R** $C_6H_8O_7$, H_2O (SRIP 1963 [illegible] 69).

[illegible] **Citric acid FeR** [illegible] R [illegible] 0.5 [illegible] R [illegible]
40 [illegible] 2 [illegible] mercaptoacetic acid R [illegible]
[illegible] (~100 [illegible]) FeTS [illegible] 50 [illegible]

[illegible] **Citric acid FeTS** [illegible] FeR [illegible] 183 [illegible]
$C_6H_8O_7$.

[illegible] **Cobalt colour, strong, TS** [illegible]

[illegible] *assay* [illegible] 8.0 [illegible] cobaltous chloride R [illegible] 120 [illegible] (~10
[illegible] TS [illegible] $CoCl_2,6H_2O$.

[illegible] *assay* [illegible] 5.0 [illegible] 100 [illegible] 10 [illegible]
[illegible] 10 [illegible] 0.5 [illegible] hydrogen peroxide (~60
boiling chips [illegible] TS [illegible] (80 [illegible]) TS [illegible] 10 [illegible]
hydrogen peroxide [illegible]
25 [illegible] R [illegible] 1 [illegible] 20 [illegible] 10 [illegible]
[illegible] VS (2 [illegible]) [illegible]
TS [illegible] VS (0.01 [illegible]) [illegible]
$CoCl_2, 6H_2O$ [illegible] 2.380 [illegible] VS (0.01 [illegible]) [illegible] 1 [illegible]

[illegible] **Cobalt colour TS** [illegible] 60.0 [illegible] $CoCl_2, 6H_2O$.

ÂǬÀţä ǨǒÀǣ ζ Ǭǒä ȷ ζǒ ǒζŸʈ ȤǢÀǺǬǣ Ǭŋ 100 Ž $CoCl_2, 6H_2O$ ȹŋ ȟ 6.000 ɁŸȝ Ƀζʠʒ ǒζŸʈ ÀŸȒǶŀ .ǒäÄǅqä
.ǥǿşÀȒǒä ǼÀȝ ÛTS (ǒ/ȟ 10~) ǬÀǿζÀŸÊǒä ȐŧƜ TS

.(70 ǴǶÀÔǒä Û1963 ÛSRIP) $CoCl_2, 6H_2O$ ،**Cobaltous chloride R** äζǬǒÀǣζǒǒä ǼÀǿζŸǬ

.(72 ǴǶÀÔǒä Û1963 ÛSRIP) **Congo red paper R** ζȣǬζǒǒä ǥÀŧǧ àǿş

،**Copper colour, strong, TS** ÛÂǬÀţä Û âÀǶÀǒä ȷ ζǒ ǒζŸʈ

ÛTS (ǒ/ȟ 10~) ǬÀǿζÀŸÊǒä Ȑƅ ǒζŸʈ ȹŋ Ǭŋ 120 Ž R (II) âÀǶÀǒä ǧÀÀŸè ȹŋ ȟ 8.0 âäǾŀ .ǒäÄǅqä
.$CuSO_4, 5H_2O$ ÂǬÀǩ ȹȞŀş ÛÀǿşÀȑ Ǭǒǣ ȷÀǬ äǣÛ Ûǒζŧä ǴȑÀŀ

ǴǅÀǅà ǴŸǅζǧ ƂÛ ǒζŸŧä äǾȽ ȹŋ Ǭŋ 10 ǬǬŀ .Ǭŋ 100 ʓÀǬq ǒÀţä ȹŋ ȣÀǬ ǿäǼǬŋ Ǭŋ 5.0 ȤÀÀŀ .ǴÊÀÀǬţä
.R ȾǅζŸʓǒä ǬǬǣèɉä Ȑƅ ȹŋ Ǭŋ 5ş ÛR ȳζǣèÀǩζǴǒä ǼÀǻζÀ ȹŋ ȟ 1ş ÛǒÀţä ȹŋ Ǭŋ 20 ȣÀȒŀ ÛǥǻäǼè ǧäǣ
TS ÀÎÀǒä ǒζŸʈ ǒÀŧȞǬèÀǣ ÛVS (ǒ/ǒζŋ 0.01) ȳζǻζÔǒä ǧÀÀŸèζǬ ǒζŸǶŧê ǿÀǶǬţä ǻζǬǒä ÀÀȞŀ ÛĘǝÀçǻ 10 ǼȞǣş
.$CuSO_4, 5H_2O$ ȹŋ ŊŸŋ 2.497 ǜζÀǒŀ VS (ǒ/ǒζŋ 0.01) ȳζǻζÔǒä ǧÀÀŸèζǬ ǒζŸʈ ȹŋ Ǭŋ 1 Ǭǒ .ÀȞÎŧǒ

.$CuSO_4, 5H_2O$ ȹŋ ǒ/ȟ 60.0 ɁŸȝ Ƀζʠʒ ǒζŸʈ ،**Copper colour, TS** âÀǶÀǒä ȷ ζǒ ǒζŸʈ
TS ÂǒÀţä âÀǶÀǒä ǒζŸʈ ȤǢÀǺǬǣ Ǭŋ 100 Ž $CuSO_4,5H_2O$ ȹŋ ȟ 6.000 ɁŸȝ Ƀζʠʒ ǒζŸʈ ÀŸȒǶŀ .ǒäÄǅqä
.ÀǿşÀȑ Ǭǒǣ ȷÀǬ äǣÛ ÛTS (ǒ/ȟ 10~) ǬÀǿζÀŸÊǒä Ȑƅ ǒζŸǶŧê

.(73 ǴǶÀÔǒä Û1963 ÛSRIP) .$CuSO_4, 5H_2O$ ،**Copper (II) sulfate R** âÀǶÀǒä ǧÀÀŸè

160 ǴäÀǥ ɃşÀƩä R (II) âÀǶÀǒä ǧÀÀŸè ǒζŸʈ .**TS ǒ ȟ 160 Copper (II) sulfate** âÀǶÀǒä ǧÀÀŸè ǒζŸʈ
.$CuSO_4$ ȹŋ ǒ/ȟ

.(73 ǴǶÀÔǒä Û1963 ÛSRIP) .$C_{25}H_{30}ClN_3$.**Crystal violet R** ǥǿζŸǴţä ǴǅÊÀÀǴǒä

Ž âäǾȟ R ǥǿζŸǴŋ ǴǅÊÀÀǣ ǒζŸʈ .**Crystal violet/acetic acid TS** ǬǬǣèɉä Ȑƅ ǥǿζŸǴţä ǴǅÊÀÀǴǒä ǒζŸʈ
.ǒ/ȟ 5 ǴäÀǥ ɁŸȝ ÀζǬʈ R1 ȾǅζŸʓǒä ǬǬǣèɉä Ȑƅ

،**Culture medium Cm1** ǨǬÀÊţä

pancreatic digest of ȹÀàÀǑŸǒ ǴǣèÀÀÀǑÀǴǒä ǴŋÀȒǬä ȹŋ ȟ 4.0ş ÛR ȤÀǅţä ȷ ζǬǴǒä ȹŋ ȟ 6.0 âäǾŀ .ǒäÄǅqä
ȹŋ ȟ 1.0ş ÛR ÀǬǴǒä ȴƩ ǴǒŸǹ ȹŋ ȟ 1.5ş ÛR ǒÀţä Ž ǴäşǾǒä yeast ǥǨŧȤä ǴǒŸǹ ȹŋ ȟ 3.0ş Ûcasein R
.Ǭŋ 1000 ʓÀǬq ǒÀţä ȹŋ ȣÀǬ ǿäǼǬŋ Ž agar R ǿÀɖǿä ǒäÀɖ ȹŋ ȟ 20-10ş ÛR äζǬζŸȣǒä ǧäǿǼȽ
şÛ ǧÀǬζÛèɍä ȴȝǼǒ ǴǣζÀǬ ǴǣŸÔǣ ȷ ζǑÀ ȷäǣ ǨǴǬÊŧŸǒ ǬŧȞǬÊţä R ǿÀɖǿä ǒäÀɖ ǿäǼǬŋ ǴŧÊÀ ȷÛ Ǽȥ :ǴʈǥŸŋ
.ȳŸTä ǴǬǴÛǒ tearing ţÀŋǻ ǫşǼǥ ȷşǻ âζǬǬ ʒÛǬǣ ǴŧÊǬ

Culture medium Cm2

Ingredients per 1 L: pancreatic digest of casein 3.0 g; papaic digest of soybean meal 2.5 g; dipotassium hydrogen phosphate 2.5 g; agar 10.0 g; polysorbate 80 10 g; final pH 7.3 ± 0.2 at 25 °C.

Dissolve the ingredients in the water, heating slightly if necessary. Dispense into tubes and sterilize in an autoclave at 121 °C for 15 minutes. Cool rapidly and store at 2 - 8 °C.

Culture medium Cm3

Ingredients per 1 L: yeast extract 2.4 g; papaic digest of soybean meal 4.7 g; pancreatic digest of casein 9.4 g; dipotassium hydrogen phosphate 2.5 g; agar 10.0 g; polysorbate 80 10.0 g; final pH 7.3 ± 0.2 at 25 °C.

Dissolve the ingredients in the water, heating slightly if necessary. Dispense into tubes and sterilize in an autoclave at 121 °C for 15 minutes. Cool rapidly and store at 2 - 8 °C.

Culture medium Cm4 (thioglycolate mercaptoacetate)

Ingredients per 1 L: L-cystine 0.5 g; mortar 0.5 g; pancreatic digest of casein 15.0 g; yeast extract 5.0 g; papaic digest of soybean meal 5.5 g; dipotassium hydrogen phosphate 2.5 g; agar 0.75 g; polysorbate 80 10.0 g; final pH 7.3 ± 0.2 at 25 °C.

Dissolve the ingredients in the water, heating slightly if necessary. Dispense into tubes and sterilize in an autoclave at 121 °C for 15 minutes. Cool rapidly and store at 2 - 8 °C.

Culture medium Cm5

Ingredients per 1 L: pancreatic digest of casein 17.0 g; papaic digest of soybean meal 3.0 g; dipotassium hydrogen phosphate 2.5 g; sodium chloride 5.0 g; agar 10.0 g; final pH 7.3 ± 0.2 at 25 °C.

Dissolve the ingredients in the water, heating slightly if necessary. Dispense into tubes and sterilize in an autoclave at 121 °C for 15 minutes. Cool rapidly and store at 2 - 8 °C.

Culture medium Cm6

Ingredients per 1 L: pancreatic digest of casein 17.0 g; papaic digest of soybean meal 3.0 g; dipotassium hydrogen phosphate 2.5 g; sodium chloride 5.0 g; agar 10.0 g; polysorbate 80 10.0 g; final pH 7.3 ± 0.2 at 25 °C.

Dissolve the ingredients in the water, heating slightly if necessary. Dispense into tubes and sterilize in an autoclave at 121 °C for 15 minutes. Cool rapidly and store at 2 - 8 °C.

Culture medium Cm7

Ingredients per 1 L: pancreatic digest of casein 17.0 g; papaic digest of soybean meal 3.0 g; dipotassium hydrogen phosphate 2.5 g; sodium chloride 5.0 g; agar 10.0 g; polysorbate 80 10.0 g; final pH 7.3 ± 0.2 at 25 °C.

Dissolve the ingredients in the water, heating slightly if necessary. Dispense into tubes and sterilize in an autoclave at 121 °C for 15 minutes. Cool rapidly and store at 2 - 8 °C.

Culture medium Cm8

Ingredients per 1 L: pancreatic digest of casein 17.0 g; papaic digest of soybean meal 3.0 g; dipotassium hydrogen phosphate 2.5 g; sodium chloride 5.0 g; agar 10.0 g; polysorbate 80 10.0 g; final pH 7.3 ± 0.2 at 25 °C.

Dissolve the ingredients in the water, heating slightly if necessary. Dispense into tubes and sterilize in an autoclave at 121 °C for 15 minutes. Cool rapidly and store at 2 - 8 °C.

Culture medium Cm9

Ingredients per 1 L: pancreatic digest of casein 17.0 g; papaic digest of soybean meal 3.0 g; dipotassium hydrogen phosphate 2.5 g; sodium chloride 5.0 g; agar 10.0 g; polysorbate 80 10.0 g; final pH 7.3 ± 0.2 at 25 °C.

Dissolve the ingredients in the water, heating slightly if necessary. Dispense into tubes and sterilize in an autoclave at 121 °C for 15 minutes. Cool rapidly and store at 2 - 8 °C.

Culture medium Cm10

Ingredients per 1 L: pancreatic digest of casein 17.0 g; papaic digest of soybean meal 3.0 g; dipotassium hydrogen phosphate 2.5 g; sodium chloride 5.0 g; agar 10.0 g; polysorbate 80 10.0 g; final pH 7.3 ± 0.2 at 25 °C.

Dissolve the ingredients in the water, heating slightly if necessary. Dispense into tubes and sterilize in an autoclave at 121 °C for 15 minutes. Cool rapidly and store at 2 - 8 °C.

Culture medium Cm11

Ingredients per 1 L: pancreatic digest of casein 17.0 g; papaic digest of soybean meal 3.0 g; dipotassium hydrogen phosphate 2.5 g; sodium chloride 5.0 g; agar 10.0 g; polysorbate 80 10.0 g; final pH 7.3 ± 0.2 at 25 °C.

Dissolve the ingredients in the water, heating slightly if necessary. Dispense into tubes and sterilize in an autoclave at 121 °C for 15 minutes. Cool rapidly and store at 2 - 8 °C.

Culture medium Cm12

Ingredients per 1 L: pancreatic digest of casein 17.0 g; papaic digest of soybean meal 3.0 g; dipotassium hydrogen phosphate 2.5 g; sodium chloride 5.0 g; agar 10.0 g; polysorbate 80 10.0 g; final pH 7.3 ± 0.2 at 25 °C.

Dissolve the ingredients in the water, heating slightly if necessary. Dispense into tubes and sterilize in an autoclave at 121 °C for 15 minutes. Cool rapidly and store at 2 - 8 °C.

Culture medium Cm13

Ingredients per 1 L: pancreatic digest of casein 17.0 g; papaic digest of soybean meal 3.0 g; dipotassium hydrogen phosphate 2.5 g; sodium chloride 5.0 g; agar 10.0 g; polysorbate 80 10.0 g; final pH 7.3 ± 0.2 at 25 °C.

Dissolve the ingredients in the water, heating slightly if necessary. Dispense into tubes and sterilize in an autoclave at 121 °C for 15 minutes. Cool rapidly and store at 2 - 8 °C.

Culture medium Cm14

Ingredients per 1 L: pancreatic digest of casein 17.0 g; papaic digest of soybean meal 3.0 g; dipotassium hydrogen phosphate 2.5 g; sodium chloride 5.0 g; agar 10.0 g; polysorbate 80 10.0 g; final pH 7.3 ± 0.2 at 25 °C.

Dissolve the ingredients in the water, heating slightly if necessary. Dispense into tubes and sterilize in an autoclave at 121 °C for 15 minutes. Cool rapidly and store at 2 - 8 °C.

Culture medium Cm15

Ingredients per 1 L: pancreatic digest of casein 17.0 g; papaic digest of soybean meal 3.0 g; dipotassium hydrogen phosphate 2.5 g; sodium chloride 5.0 g; agar 10.0 g; polysorbate 80 10.0 g; final pH 7.3 ± 0.2 at 25 °C.

Dissolve the ingredients in the water, heating slightly if necessary. Dispense into tubes and sterilize in an autoclave at 121 °C for 15 minutes. Cool rapidly and store at 2 - 8 °C.

Culture medium Cm16

Ingredients per 1 L: pancreatic digest of casein 17.0 g; papaic digest of soybean meal 3.0 g; dipotassium hydrogen phosphate 2.5 g; sodium chloride 5.0 g; agar 10.0 g; polysorbate 80 10.0 g; final pH 7.3 ± 0.2 at 25 °C.

Dissolve the ingredients in the water, heating slightly if necessary. Dispense into tubes and sterilize in an autoclave at 121 °C for 15 minutes. Cool rapidly and store at 2 - 8 °C.

Culture medium Cm17

Ingredients per 1 L: pancreatic digest of casein 17.0 g; papaic digest of soybean meal 3.0 g; dipotassium hydrogen phosphate 2.5 g; sodium chloride 5.0 g; agar 10.0 g; polysorbate 80 10.0 g; final pH 7.3 ± 0.2 at 25 °C.

Dissolve the ingredients in the water, heating slightly if necessary. Dispense into tubes and sterilize in an autoclave at 121 °C for 15 minutes. Cool rapidly and store at 2 - 8 °C.

Culture medium Cm18

Ingredients per 1 L: pancreatic digest of casein 17.0 g; papaic digest of soybean meal 3.0 g; dipotassium hydrogen phosphate 2.5 g; sodium chloride 5.0 g; agar 10.0 g; polysorbate 80 10.0 g; final pH 7.3 ± 0.2 at 25 °C.

Dissolve the ingredients in the water, heating slightly if necessary. Dispense into tubes and sterilize in an autoclave at 121 °C for 15 minutes. Cool rapidly and store at 2 - 8 °C.

Culture medium Cm19

Ingredients per 1 L: pancreatic digest of casein 17.0 g; papaic digest of soybean meal 3.0 g; dipotassium hydrogen phosphate 2.5 g; sodium chloride 5.0 g; agar 10.0 g; polysorbate 80 10.0 g; final pH 7.3 ± 0.2 at 25 °C.

Dissolve the ingredients in the water, heating slightly if necessary. Dispense into tubes and sterilize in an autoclave at 121 °C for 15 minutes. Cool rapidly and store at 2 - 8 °C.

Culture medium Cm20

Ingredients per 1 L: pancreatic digest of casein 17.0 g; papaic digest of soybean meal 3.0 g; dipotassium hydrogen phosphate 2.5 g; sodium chloride 5.0 g; agar 10.0 g; polysorbate 80 10.0 g; final pH 7.3 ± 0.2 at 25 °C.

Dissolve the ingredients in the water, heating slightly if necessary. Dispense into tubes and sterilize in an autoclave at 121 °C for 15 minutes. Cool rapidly and store at 2 - 8 °C.

.Soybean-casein digest medium **Culture medium Cm5**

pancreatic digest of casein R 3.0 17.0

soyabean meal R papaic digest 2.5 R 0.5

.R 2.5 R

1000

(1 VS

.7.5 - 7.1

.°ÿ 121 20 -18

(thioglycolate) mercaptoacetate **Culture medium Cm6**

.penicillinase

TS Cm4

Cm4 TS penicillin

cm6

48 - 24 °ÿ 32-30

soybean-casein digest **Culture medium Cm7**

.penicillinase

polysorbate R 80 5.0 Cm5

TS

TS Cm5

.(74 1963 SRIP) C_6H_{12} **Cyclohexane R**

.(75 1963 SRIP) $C_6H_{12}N_2O_4S_2$ **L-Cystine R**

CH_2Br_2 Methylene bromide **Dibromomethane R**

miscibility .R R TS (750~)

[illegible] **Dichloromethane R** [illegible] Methylene chloride [illegible] CH_2Cl_2.

[illegible] *miscibility* [illegible] (750~ [illegible]) TS [illegible] R.

[illegible] 95% [illegible] 39 [illegible] 41 °[illegible].

[illegible] *residue on evaporation* [illegible] 105 °[illegible]

[illegible] 0.5 [illegible].

[illegible] **Dichromate colour, strong, TS** [illegible]

[illegible] 6.0 [illegible] R [illegible] 120 [illegible] (10~ [illegible])

[illegible] TS [illegible] $K_2Cr_2O_7$.

[illegible] *assay* [illegible] 5.0 [illegible] 50 [illegible] 10 [illegible]

[illegible] 10 [illegible] 2 [illegible] R [illegible] 20 [illegible]

[illegible] (100~ [illegible]) TS. [illegible] 1 [illegible]

[illegible] R [illegible] 5 [illegible]

[illegible] (0.1 [illegible]) VS [illegible] TS [illegible] 1 [illegible]

(0.1 [illegible]) VS [illegible] 4.904 [illegible] $K_2Cr_2O_7$.

[illegible] **Dichromate colour TS** [illegible] 4.904 [illegible] $K_2Cr_2O_7$.

[illegible] 490.35 [illegible] $K_2Cr_2O_7$ [illegible] 100 [illegible]

[illegible] TS [illegible] (10~ [illegible]) TS [illegible]

[illegible] **Diethylene glycol R** [illegible] $C_4H_{10}O_3$ [illegible]

[illegible]

[illegible] *miscibility* [illegible] (750~ [illegible]) TS [illegible] R [illegible] R.

[illegible] 240 [illegible] 250 °[illegible].

[illegible] *Mass density* (Q_{20}). 1.117-1.120 [illegible].

[illegible] 60 [illegible] 250 [illegible] TS [illegible]

[illegible] (0.02 [illegible]) VS [illegible] 15 [illegible]

[illegible] 2.5 [illegible].

Dimethylformamide R C_3H_7NO

Dimethyl-POPOP **1,4-Di[2-(methyl-5-phenyloxazole)]benzene R** $C_{26}H_{20}N_2O_2$

Dioxan R **1,4-Dioxane** $C_4H_8O_2$

Diphenylbenzidine R $C_{24}H_{20}N_2$

[illegible] 250-246 °[illegible].

[illegible] *sulfated ash* [illegible] 1.0 [illegible].

[illegible] *nitrates* [illegible] 8 [illegible] (~1750 [illegible]) [illegible] TS 5 [illegible].

Diphenylcarbazone R [illegible] $C_{13}H_{12}N_4O$ (SRIP 1963 [illegible] 81).

Diphenylcarbazone/ethanol TS [illegible] R [illegible] (~750 [illegible]) TS [illegible] 1 [illegible] $C_{13}H_{12}N_4O$.

Diphenyl ether R [illegible] $C_{12}H_{10}O$.

[illegible] *miscibility* [illegible] R [illegible].

[illegible] 259 °[illegible].

[illegible] 28-26 °[illegible].

2,5-Diphenyloxazole R [illegible] PPO [illegible] $C_{15}H_{11}NO$ [illegible] scintillation counting.

Dipotassium hydrogen phosphate R [illegible] K_2HPO_4 (SRIP 1963 [illegible] 81).

Disodium edetate R [illegible] $C_{10}H_{14}N_2NaO_8, 2H_2O$ (SRIP 1963 [illegible] 82).

Disodium edetate [illegible] **0.05** [illegible] **VS** [illegible] R [illegible] 16.71 [illegible] $C_{10}H_{14}N_2Na_2O_8$ [illegible] 1000 [illegible].

standardization [illegible] 200 [illegible] R2 [illegible] 400 [illegible] 10 [illegible] slurry [illegible] 2 [illegible] TS (~70 [illegible]) [illegible] 100 [illegible].

[illegible] 10 [illegible] 50 [illegible] burette [illegible] 30 [illegible]
[illegible] R [illegible] 0.3 TS [illegible] 70~ [illegible]
[illegible] R [illegible]
[illegible] 0.05 [illegible] 1 [illegible] 5.005 [illegible]
.VS

[illegible] **Disodium hydrogen phosphate, anhydrous, R** [illegible]
[illegible] R [illegible] Na_2HPO_4 (SRIP [illegible] 1963 [illegible] 193).

[illegible] **Ethanol, dehydrated, R** C_2H_5OH (SRIP [illegible] 1963 [illegible] 85).

[illegible] **Ethanol** [illegible] **750~** TS [illegible] 95 [illegible] R (SRIP [illegible] 1963 [illegible] 84).

[illegible] **750~** [illegible] **Ethanol, sulfate-free, TS** [illegible] 750~ [illegible]
TS [illegible] 25 [illegible] 750~ TS [illegible] 2 [illegible]
[illegible] 3 [illegible] 70~ TS [illegible] 42 [illegible] 5 [illegible]
[illegible] TS [illegible] 113 [illegible]
[illegible] 750~ [illegible] TS [illegible] 20 [illegible].

[illegible] **710~ TS.** [illegible] 950 [illegible] 750~ TS [illegible] 1000 [illegible].

[illegible] **375~ TS.** [illegible] 525 [illegible] 750~ TS [illegible] 1000 [illegible].

[illegible] **150~ TS.** [illegible] 210 [illegible] 750~ TS [illegible] 1000 [illegible].

[illegible] **Ether R.** $C_4H_{10}O$ (SRIP [illegible] 1963 [illegible] 85).

[illegible] **Ethyl acetate R.** $C_4H_8O_2$ (SRIP [illegible] 1963 [illegible] 86).

[illegible] **Ethylene glycol monoethyl ether R**, $C_4H_{10}O_2$,
[illegible]
miscibility [illegible] TS [illegible] 750~ [illegible] R [illegible] R.
[illegible] %95 [illegible] 133 [illegible] 135 °[illegible].
Mass density [illegible] (Q_{20}). [illegible] 0.93 [illegible].

[illegible] **Ferric ammonium sulfate R**, $FeNH_4(SO_4)_2, 12H_2O$ (SRIP [illegible] 1963 [illegible]
88).

ÿzŀǫzŋǰä ğÅÀŸè ȸŋ òzŸʈ **.TS ò ȟ 45 Ferric ammonium sulfate** ȬÅÆÅÆΣäş ÿzŀǫzŋǰä ğÅÀŸè òzŸʈ
.$FeNH_4(SO_4)_2$ ȸŋ ò/ȟ 45 ǦäãÀȩ Ƀzʒ R ȬÅÆÅÆΣäş

.(88 ǦĦÀÔöä Û1963 ÛSRIP) $FeCl_3,6H_2O$ **.Ferric chloride R** ȬÅÆÅÆΣä ÆÅøzŸõ

ò/ȟ 27 ǦäãÀȩ Ƀzʒ R ȬÅÆÅÆΣä ÆÅøzŸõ ȸŋ òzŸʈ **،TS ò ȟ 25 Ferric chloride** ȬÅÆÅÆΣä ÆÅøzŸõ òzŸʈ
.$FeCl_3$ ȸŋ

ǦĦÀÔöä Û1963 ÛSRIP) $FeNH_4(SO_4)_2, 6H_2O$ **،Ferrous ammonium sulfate R** àşÆÅÆΣäş ÿzŀǫzŋǰä ğÅÀŸè
.(89

ÿzŀǫzŋǰä ğÅÀŸè ȸŋ òzŸʈ **.TS ò ȟ 1 Ferrous ammonium sulfate** àşÆÅÆΣäş ÿzŀǫzŋǰä ğÅÀŸè òzŸʈ
.$FeNH_4(SO_4)_2$ ȸŋ ò/ȟ 1 ǦäãÀȩ Ƀzʒ R àşÆÅÆΣäş

.(90 ǦĦÀÔöä Û1963 ÛSRIP) $FeSO_4, 7H_2O$ **،Ferrous sulfate R** àşÆÅÆΣä ğÅÀŸè

åƎŋş ƟŸ8ŋ ŏÅŋ Ž R àşÆÅÆΣä ğÅÀŸè ȸŋ òzŸʈ **.TS ò ȟ 15 Ferrous sulfate** àşÆÅÆΣä ğÅÀŸè òzŸʈ
.(ò/òzŋ 0.1 ā øÅÖŀ Åŋ) $FeSO_4$ ȸŋ ò/ȟ 15 ǦäãÀȩ ʔŸʒ Ƀzǫ ʒàÅù ŌÒÎæ
.ÅDZàÅù ÅÀȒʈTS (ò/ȟ 15) àşÆÅÆΣä ğÅÀŸè òzŸʈ ɉzÒÅ ɉ Æƶ .*ǦʈǵŶŋ*

.VS ò òzŋ 0.1 Ferrous sulfate àşÆÅÆΣä ğÅÀŸè òzŸʈ

ǦŀƫõȢÅȒŀş Ûʒ àÅù ŌÒÎæ åƎŋş ƟŸ8ŋ ŏÅŋ ȸŋ Ōŋ 90 Ž R àşÆÅÆΣä ğÅÀŸè ȸŋ ȟ 2.8 ā äØŀ .*ŏäÅDZqå*
.Ōŋ 100 ʒÅǫqTS (ò/ȟ 1750~) ȬÅøzÀŸÊöä Ȑ þ òzŸʈ ȸŋ ǦŀzÅõ

:ǦŀõÅǫöä ǦŌÅÀÛöä ÆÊɯ ò/òzŋ 0.1 òzŸĦƫŸõ ĘŀęÆöä ÂŀõÀǫöä ȸŋ ĘŌĦǫöä ɭǫÅ *.standardization* *ȄŀŌǫöä ǦŌÅù*
ÀÅÅĦŀş TS (ò/ȟ 1.440~) ȬÅøzÀÊÅöä Ȑ þ òzŸʈ ȸŋ Ōŋ 5 àşÆÅÆΣä ğÅÀŸè òzŸʈ ȸŋ Ōŋ 40.0 ƂȢÅȒŀ
.VS (ò/òzŋ 0.02) potassium permanganate ÿzŀèÅkzǦöä ğÅǫÅ8ÅŋǨæ òzŸĦƫê Åøzz
.òÅƫĦǫèɾä ŌǤę ğÀïÅǤŋ ȄŀŒŀ .*ǦʈǵŶŋ*

ǦĦÀÔöä Û1963 ÛSRIP) CH_2O_2 . R ȬŀŋøzÀöä Ȑ þ **TS ò ȟ 1080~ Formic acid** ȬŀŋøzÀöä Ȑ þ òzŸʈ
.*d*~1.2 (92

.ǦǤèÅÅŋ ǥşÅŌÅæ ÿŸŁ **،Gelatin R** ÿŸŢä

.ò/ȟ10 ǦäãÀȩ Ƀzʒ TS Û7.0 ŏÅŁÅǤöä Ûğ ÅÀÊÅöä Ǧəøäå Ž ā äØŀä R ÿŸŢä ȸŋ òzŸʈ **،Gelatin TS** ÿŸŢä òzŸʈ
ğ äøÆŀŢä ɃåÅǵ àzǫǨæzõzŸɖ **،Glucose hydrate R** àzõzŸ8öä ğ äøÆŀŁ

ȸʒ ÆÅÂÅ ɼş %99.0 ȸʒ ŌŌÅ ɼ Åŋ ʔŸʒ Ƀzǫʒ .$C_6H_{12}O_6$, H_2O Ûmonohydrate of α-D-glucopyranose

[illegible] $C_6H_{12}O_6$ [illegible] %101.5

[illegible]

[illegible] 60 [illegible] 1 [illegible] (750~ [illegible]) TS [illegible]

[illegible] (750~ [illegible]) TS.

acidity [illegible] 5 [illegible] 50 [illegible] R. [illegible]

[illegible] 0.5 [illegible] (0.02 [illegible]) VS [illegible]

[illegible] TS [illegible].

specific optical rotation [illegible] 100 [illegible] 1 [illegible]

$[\alpha]_D^{20^\circ C}$ = +52 to +53 TS (100~ [illegible]) [illegible].

soluble starch or sulfates [illegible] 1 [illegible] 10 [illegible] 1 [illegible]

[illegible] TS [illegible].

[illegible] 105 [illegible] 80 [illegible] 100

[illegible].

sulfated ash [illegible] 1.0 [illegible].

assay [illegible] 0.1 [illegible] 50 [illegible] 30 [illegible] (0.1

15 [illegible] 20 [illegible] (50 [illegible]) TS [illegible] 10 VS [illegible] (0.1

[illegible] (70 [illegible]) TS [illegible]

[illegible] 1 [illegible] TS [illegible] VS [illegible]

[illegible] 9.008 [illegible] $C_6H_{12}O_6$ [illegible] (0.1 [illegible]) VS [illegible].

Glycerol R [illegible] Propane-1,2,3-triol [illegible] $C_3H_8O_3$.

[illegible] 970 [illegible] $C_3H_8O_3$.

[illegible]

miscibility [illegible] (750~ [illegible]) TS [illegible] R [illegible]

[illegible] R.

Mass density [illegible] (Q_{20}) [illegible] 1.256 [illegible].

refractive index [illegible] (n_D^{20}) [illegible] 1.469 [illegible].

[illegible] 1 [illegible] 1 [illegible] (100~ [illegible]) TS [illegible]

[illegible] 3 [illegible] 5 [illegible] 6 [illegible]

[illegible] 5 [illegible] TS ([illegible] 40) [illegible]

[illegible] 0..5 [illegible]

Glyoxal bis(2-hyroxyanil) R [illegible] 2,2′-(Ethanediylidenedinitrilo) diphenol [illegible] $C_{14}H_{12}N_2O_2$.

[illegible]

[illegible] TS ([illegible] 750~) [illegible]

[illegible] 2.5-2.3 °[illegible]

Glyoxal bis(2-hyroxyanil) TS [illegible] Glyoxal bis(2-hyroxyanil) R [illegible] TS ([illegible] 750~) [illegible] 10 [illegible] $C_{14}H_{12}N_2O_2$.

Green stock standard TS [illegible]

[illegible] 3.5 [illegible] 20.1 [illegible] TS [illegible] 10.4 [illegible] 4.0 [illegible] 1000 [illegible] TS ([illegible] 10~) [illegible]

Helium R [illegible] **He** [illegible] 999.95 [illegible] He.

Heparinized saline TS [illegible] 50 [illegible] TS [illegible] 1 [illegible]

Histamine, strong, TS [illegible] 1.00 [illegible]

[illegible] 138.1 [illegible] 82.8 [illegible] R [illegible] 50.0 [illegible] R [illegible]

[illegible] TS [illegible] 10-4 [illegible]

[illegible] 30 [illegible]

Histamin TS [illegible] 1.0 [illegible]

[illegible] TS [illegible] TS [illegible] TS [illegible]

[illegible] TS [illegible]

Histamine dihydrochloride R [illegible] $C_5H_9N_3$,2HCl [illegible]

[illegible] %98.0 [illegible] %101.0 [illegible] $C_5H_9N_3$,2HCl [illegible]

.ǦHuәăÀöă ĆÆƷ ÜȷzŸöă ȒŁăÜ ɃøzŸă ȧzHuÊɳ şÜ ȷzŸöă ǦƺÆƷ ğăøzŸă . *ȤöȤöă*

.TS (ȯ/ȟ 750~) ȯzφĂȷ̈ɋă ȯzŸȚ Ž ā ăşă ÜR ȯzφĂȷ̈ɫă Žş ŏĂɫă Ž ȷĂăşǾöă Àǵ . *ǦĦpĂăşǾöă*

.°ÿ 246-244 . *øĂȚÔφɍă ȯĂƒ*

.ȟ/ɳŸɳ 5.0 ȡƷ ÆÂÂ ɍ . *ȤĦÀDzφöĂă ÆŎĂöă*

Ŏɳ 25ş R ÿøzzşøzŸȮöă ȡɳ Ŏɳ 5 ȣĂȒŀ .ŏĂɫă ȡɳ Ŏɳ 10 Ž ÛǦĦùzǦȒɳ Ǧφşàzɳ Ûȟ 0.15 ǦăăÀɇ ā ăØŀ . *ǦÊÂĂŎɫă*

(ȯ/ȯzɳ 0.2) ğĂφzăÀȮöă ȡɳ ƃĂʅă ÿzÂǻzÔöă ÆĦÊÕşøÆĦŁ ȯzŸHuɫɇ ÀÂĂȞŀ .TS (ȯ/ȟ 750~) ȯzφĂȷ̈ɋă ȯzŸȚ ȡɳ

ÆĦÊÕşøÆĦŁ ȯzŸȚ ȡɳ Ŏɳ 1 ŎÕ .ÀȞÎɫÕ TS ȯzφĂȷ̈ɋă/ƙĂöĂȷ̈z ȯzɫĦȷ̈öă ȯzŸȚ ȡɳ Ŏɳ 0.5 ÿăÆǺφèĂă ÛVS

.$C_5H_9N_3$,2HCl ȡɳ ɳŸɳ 9.21 ùzĂȮŀ VS (ȯ/ȯzɳ 0.2) ğĂφzăÀȮöă ȡɳ ƃĂʅă ÿzÂǻzÔöă

ÆÂÂ ɍş %98.0 ȡƷ ŎŎÂ ɍ Ăɳ ʔŸƷ ɃzφƷ .$C_5H_9N_3$,$2H_3PO_4$ ،**Histamine phosphate R** ƙɳĂφÊĦȚă ğĂÂÊɀ

.ǦĦәĂɳɎöă ğǻĂɫă ƃÜ ţzDZÀöĂă ǦăzÊȚ Û$C_5H_9N_3$,$2H_3PO_4$ ȡɳ %101.0 ȡƷ

.ŏăzȚă Ž ǦφăĂφ .ǦHuәăÀöă ǦƺÆƷ ÜȷzŸöă ǦƺÆƷ ÛǦŸÂzù ÛǦÂøzìzɳ ğăøzŸă . *ȤöȤöă*

.TS (ȯ/ȟ750~) ȯzφĂȷ̈ɋă ȯzŸȚ Ž ȷĂăşǾöă ǦHuĦHuì ÜöĂɫă ȡɳ ŏăÂDZÜ 5 ǦăăÀɇ Ž Ǧăăşɇ . *ǦĦpĂăşǾöă*

.°ÿ 132 ǦăăÀɇ . *øĂȚÔφɍă ǥøăÀǵ ǦDZøǻ*

.ȟ/ɳŸɳ 60-50 zŁ ŏĂɫă ȡɳ ʔzφɨă Ûȟ 1.0 ǦăăÀɇ ȯĂɫȞφèĂă ÛÀÎĦz ȯøĂÕ ǦŎÂÀÛă ȡĦȞŀ . *water ŏĂɫă*

Ŏɳ 25ş R ÿøzzşøzŸȮöă ȡɳ Ŏɳ 5 ȣĂȒŀ .ŏĂɫă ȡɳ Ŏɳ 10 Ž ÛǦĦùzǦȒɳ Ǧφşàzɳ Ûȟ 0.15 ǦăăÀɇ ā ăØŀ . *ǦÊÂĂŎɫă*

(ȯ/ȯzɳ 0.2) ğĂφzăÀȮöă ȡɳ ƃĂʅă ÿzÂǻzÔöă ÆĦÊÕşøÆĦŁ ȯzŸHuɫɇ ÀÂĂȞŀ .TS (ȯ/ȟ 750~) ȯzφĂȷ̈ɋă ȯzŸȚ ȡɳ

ÆĦÊÕşøÆĦŁ ȯzŸȚ ȡɳ Ŏɳ 1 ŎÕ .ÀȞÎɫÕ TS ȯzφĂȷ̈ɋă/ƙĂöĂȷ̈z ȯzɫĦȷ̈öă ȯzŸȚ ȡɳ Ŏɳ 0.5 ȯĂɫȞφèĂă VS

.$C_5H_9N_3$,$2H_3PO_4$ ȡɳ ɳŸɳ 15.36 ùzĂȮŀ VS (ȯ/ȯzɳ 0.2) ğĂφzăÀȮöă ȡɳ ƃĂʅă ÿzÂǻzÔöă

ȡɳ ÆәăzÎöă ȷzȮφǩ ÛHo_2O_3 ȡɳ %99.9 ȡƷ ŎŎÂ ɍ Ăɳ ʔŸƷ ɃzφƷ .Ho_2O_3 .**Holmium oxide R** ÿzĦɫzȚă ÆĦÊÕĂ

.Dy_2O_3ş Er_2O_3

.Àþɉă ƃÜ āøĂȓ ȷzŸă ȧzHuÊɳ . *ȤöȤöă*

.ŏĂɫă Ž ā ăşă Ƙɖ . *ǦĦpĂăşǾöă*

،**Holmium perchlorate TS** ÿzĦɫzȚă ğăøzŸÕƘă ȯzŸȚ

TS (ȯ/ȟ 140~) ŎÂøzŸÕƘǦöă Ȓþ ȯzŸȚ ȡɳ ǭȣĂÕ øÆŎɳ Ž R ÿzĦɫzȚă ÆĦÊÕĂ ȡɳ ȟ 40 ā ăØŀ . *ŏăÀDZzɋă*

.Ŏɳ 1000 ȷ̈Ăφɋ

Û1963 ÛSRIP) HI . R ŎÂǻzÂøÆĦȚă Ȓþ .**TS ȯ ȟ 970~ Hydriodic acid** ŎÂǻzÂøÆĦȚă Ȓþ ȯzŸȚ

.(95 ǦHuĂÔöă

. R Û3ĜÎţǟ ÛȬǾǿǽŸõşǿǼĽŢǟ R̀ þ .TS ȯ ȟ 420~ **Hydrochloric acid** ȬǾǿǽŸõşǿǼĽŢǟ R̀ þ ȯǽŸŢ

.*d*~1.18 Ü(96 ĞĤĀÔǖ Û1963 ÛSRIP)

420~) ȬǾǿǽŸõşǿǼĽŢǟ R̀ ŧΣ ȯǽŸŢ .TS ȯ ȟ **250~ Hydrochloric acid** ȬǾǿǽŸõşǿǼĽŢǟ R̀ þ ȯǽŸŢ

.*d*~1.12 ÜHCl ȡŋ ȯ/ȟ 250 ǟǿÕ̇Ǻ Ȧŋ ʔŸʒ ɃǽǬʒ ÛŏȦţǟ Ž TS (ȯ/ȟ

250~) ȬǾǿǽŸõşǿǼĽŢǟ R̀ þ ȯǽŸŢ .**Hydrochloric acid** ȯ ȟ **250 AsTS** ȬǾǿǽŸõşǿǼĽŢǟ R̀ þ ȯǽŸŢ

:BŞ A ƙĽŏȦǬǟ ȡǾǿȦǬǹɍǟ ɄǿĜŶł ɃǾ̄ǟ TS (ȯ/ȟ

(ȯ/ȟ 75) ȳǽĽǬǽŋɉǟ ğȦǬȦĽȅǽĽǬ ȯǽŸŢ ȡŋ Ō̇ŋ 5 ȣȦR̂ł ÛŌ̇ŋ 50 ʓȦǬǬɋ ŏȦţǟ ȡŋ ȣȦõ ǿǟǼŌ̇ŋ Ō̇ŋ 10 ƵȦȦ́ł .A

.ȷǽŏ ɃÜ ǰǬǺ ɍ ÜğȦȉȦĜŋ ȭȦĦǸŀş TS

ȣȦR̂ł ÛŌ̇ŋ 16 ɃÜ ȯȦǬȦ́ł ʔǿǬǵ ɄəȦŋ ȳȦþ ʔŸʒ ȦȦ́Ǥł ÛAsTS ȳşƎǟ ȡŋ Ō̇ŋ 0.2 ǿǟǼŌ̇ŋ Ō̇ŋ 50 ɃÜ ȣȦR̂ł .B

ÛȷǽŸǟ ȡŋ Õ̇ǿǽ ʔŸʒ ȭǼǬÊł ÛȻȦŋ ğȦȦȁ ǻǽǱş ȡŋ ǼõǖǬŸõ ȦǾǿşȦȑ ȷȦõ ǟǽÜ AsTS ȳşƎǟ ȯǽŸŢ ȡŋ Ǝ̄õÜ ǿǟǼŌ̇ŋ

stannous chloride AsTS ɃȦǼÔŌ̇ǟ ǼǾǿǽŸõ ȯǽŸŢ ȡŋ ğǟȦÛę 5ş ŏȦţǟ ȡŋ Ō̇ŋ 50 ȣȦR̂ł .ƘȦ́ǬǬǟ ğǼŋ ȯǟǽü

ȡŋ ǰǬǺ ɃǾ̄ǟ Õ̇ǿǽ ȡŋ ğǼȉ Ȧǯ̄õÜ ĞϴȦǺǟ ǦȦ́ÛǬǟ ȷǽŏ ȷǽȮǺ ɍ .(N̈ĽǿǿÂǟ) ȬĽǼȅǿɉǟ ŌǱɉ ȳȦȞǟ ǿȦǬǹɍǟ ĘĜÛłş

.Ō̇ŋ/ȳǟȦȡşȦȮŋ 0.05 ʔŸʒ ǼȦÂǺ ɍ ȬĽǼȅǿɉǟ ǿǟǼŌ̇ŋ ȷÜ ʔŸʒ ğȦȚŢȟ ÛĜǾǿȦĽȞǭ ǦȦ́ÛǬ Ō̇ŋ 0.2

. **AsTS** ȯ ȟ **250~ Hydrochloric acid, stannated** ɃǿǼĽÔŌ̇ǟ ÛȬǾǿǽŸõşǿǼĽŢǟ R̀ þ ȯǽŸŢ

250~) ȬǾǿǽŸõşǿǼĽŢǟ R̀ þ ȯǽŸŢ ȡŋ ȣȦõ ǿǟǼŌ̇ŋAsTS ɃȦǼÔŌ̇ǟ ǼǾǿǽŸõ ȯǽŸŢ ȡŋ Ō̇ŋ 1 ƵȦȦ́ł .*ǒǟȦǱɋǟ*

.Ō̇ŋ 100 ʓȦǬǬɋ AsTS (ȯ/ȟ

.**TS** ȯ ȟ **70~ Hydrochloric acid** ȬǾǿǽŸõşǿǼĽŢǟ R̀ þ ȯǽŸŢ

1000 ʓȦǬǬɋ ŏȦţǟ ȡŋ ȣȦõ ǿǟǼŌ̇ŋ TS (ȯ/ȟ 250~) ȬǾǿǽŸõşǿǼĽŢǟ R̀ þ ȯǽŸŢ ȡŋ Ō̇ŋ 260 ƵȦȦ́ł .*ǒǟȦǱɋǟ*

.*d*~1.035 Ü(ȯ/ȯǽŋ 2 ǟǿȦŌ̇ł Ȧŋ) Ō̇ŋ

.Cl ȡŋ ȳǟȦȡşȦȮŋ 50 ʔŸʒ ɃǽǬʒ ȦǬǖ ɄŸĽŋ 1 Ō̇õ .**Hydrochloric acid ClTS** ȬǾǿǽŸõşǿǼĽŢǟ R̀ þ ȯǽŸŢ

1000 ʓȦǬǬɋ ŏȦţǟ ȡŋ ȣȦõ ǿǟǼŌ̇ŋ VS(ȯ/ȯǽŋ 0.1) ȬǾǿǽŸõşǿǼĽŢǟ R̀ þ ȯǽŸŢ ȡŋ Ō̇ŋ 14.3 ƵȦȦ́ł .*ǒǟȦǱɋǟ*

.Ō̇ŋ

(ȯ/ȟ 250~) ȬǾǿǽŸõşǿǼĽŢǟ R̀ þ ȯǽŸŢ .**VS** ȯ ȯǽŋ **2 Hydrochloric acid** ȬǾǿǽŸõşǿǼĽŢǟ R̀ þ ȯǽŸŢ

.Ō̇ŋ 1000 Ž HCl ȡŋ ȟ 72.93 ʔŸʒ ɃǽǬĦĽŏ ŏȦţȦǽ ƵȦȦ́ł ÛTS

ȷǟǽȦʒ ǨƠ ǦǽǽȍǽţǟĜŌ̇ȦÛǟ ţȦĜǨȦǽ ȯǽŸĦŧŸŏ ĘĽęǼǟ ȦĽõȦǬǟ ȡŋ ĘŌ̇ĦǬǟ ȴǬǺ .*standardization* *Ȅ̀ĽĽǬǟ ĞŌ̇Ǻȉ̈*

.VS (ȯ/ ȯǽŋ 1) ȬǾǿǽŸõşǿǼĽŢǟ R̀ þ ȯǽŸŢ

(ȯ/ȟ 250~) ȬǾǿǽŸõşǿǼĽŢǟ R̀ þ ȯǽŸŢ .**VS** ȯ ȯǽŋ **1 Hydrochloric acid** ȬǾǿǽŸõşǿǼĽŢǟ R̀ þ ȯǽŸŢ

.Ōŋ 1000 Ž HCl ȸŋ ȟ 36.47 ƼȲȝ ɃȥǪǶǶ ǒǺƫǺ Ȥǻǻǻ ǕTS

ǦǻǻǺ ǡǻǾǻ :ǦǻǺǪǻ ǦŌǺÛǻǺ ȯ/ȯȥŋ 1 ȯȥȲǶƭȲ ĘǶęǼǻ ÂǶÕÀǪǻ ȸŋ ĘŌǶǪǻ ǈǪ.*standardization* *ȄǶǪǻ ǦŌǺü*

Ž ÛĞȝǺè 1 ǥǼŋ °ȳ 270 ǦDZǾǼǺǻ ǺǪǦÊŋ ǦǺǻǄǺƫǻ ÛR ǦǶǺŋȲǻ ȳȥǺǻȥÔǻ ğǺǶȥǻǺǷ ȸŋ ÛǦǶüȥǦȒŋ Ǧǿşȁȥŋ Ûȟ 1.5

.ǺȞÎƭõ TS ȯȥǻǺǮǺɋǻ/ŌǶǮǶƫǻ ǦǶǻǺŌǩǺǻ ȯȥȲȚ ȯǺƭǶǪèǺǻ ÛÕǺǾȥȲõşǾǼǶǶǻ Ȑþ ȯȥȲǶƭê ǺǺǺǶǶş ǒǺƫǻ ȸŋ Ōŋ 50

(ȯ/ȯȥŋ 1) ÕǺǾȥȲõşǾǼǶǶǻ Ȑþ ȯȥȲȚ ȸŋ Ōŋ 1 üȥǺǑǶ R ǦǶǺŋȲǻ ȳȥǺǻȥÔǻ ğǺǶȥǻǺǷ ȸŋ ŋȲŋ 52.99 Ōõ

.VS

(ȯ/ȟ 250~) ÕǺǾȥȲõşǾǼǶǶǻ Ȑþ ȯȥȲȚ .**VS** ȯ ȯȥŋ **0.5** **Hydrochloric acid** ÕǺǾȥȲõşǾǼǶǶǻ Ȑþ ȯȥȲȚ

.Ōŋ 1000 Ž HCl ȸŋ ȟ 18.23 ƼȲȝ ɃȥǪǶǶ ǒǺƫǺ Ȥǻǻǻ ǕTS

ȷǻȥǺȝ ǨƠ ǦȥȥòȥƫǺ ǦŌǺÛǻ ţǺǦǩǺ ȯȥȲǶƭȲ ĘǶęǼǻ ÂǶÕÀǪǻ ȸŋ ĘŌǶǪǻ ǈǪ .*standardization* *ȄǶǪǻ ǦŌǺü*

.VS (ȯ/ ȯȥŋ 1) ÕǺǾȥȲõşǾǼǶǶǻ Ȑþ ȯȥȲȚ

(ȯ/ȟ 250~) ÕǺǾȥȲõşǾǼǶǶǻ Ȑþ ȯȥȲȚ .**VS** ȯ ȯȥŋ **0.1** **Hydrochloric acid** ÕǺǾȥȲõşǾǼǶǶǻ Ȑþ ȯȥȲȚ

.Ōŋ 1000 Ž HCl ȸŋ ȟ 3.647 ƼȲȝ ɃȥǪǶǶ ǒǺƫǺ Ȥǻǻǻ ǕTS

ȷǻȥǺȝ ǨƠ ǦȥȥòȥƫǺ ǦŌǺÛǻ ţǺǦǩǺ ȯȥȲǶƭȲ ĘǶęǼǻ ÂǶÕÀǪǻ ȸŋ ĘŌǶǪǻ ǈǪ .*standardization* *ȄǶǪǻ ǦŌǺü*

.VS (ȯ/ ȯȥŋ 1) ÕǺǾȥȲõşǾǼǶǶǻ Ȑþ ȯȥȲȚ

250~) ÕǺǾȥȲõşǾǼǶǶǻ Ȑþ ȯȥȲȚ .**VS** ȯ ȯȥŋ **0.015** **Hydrochloric acid** ÕǺǾȥȲõşǾǼǶǶǻ Ȑþ ȯȥȲȚ

.Ōŋ 1000 Ž HCl ȸŋ ȟ 0.5470 ƼȲȝ ɃȥǪǶǶ ǒǺƫǺ Ȥǻǻǻ ǕTS (ȯ/ȟ

ȷǻȥǺȝ ǨƠ ǦȥȥòȥƫǺ ǦŌǺÛǻ ţǺǦǩǺ ȯȥȲǶƭȲ ĘǶęǼǻ ÂǶÕÀǪǻ ȸŋ ĘŌǶǪǻ ǈǪ .*standardization* *ȄǶǪǻ ǦŌǺü*

.VS (ȯ/ ȯȥŋ 1) ÕǺǾȥȲõşǾǼǶǶǻ Ȑþ ȯȥȲȚ

250~) ÕǺǾȥȲõşǾǼǶǶǻ Ȑþ ȯȥȲȚ .**VS** ȯ ȯȥŋ **0.01** **Hydrochloric acid** ÕǺǾȥȲõşǾǼǶǶǻ Ȑþ ȯȥȲȚ

.Ōŋ 1000 Ž HCl ȸŋ ȟ 0.3647 ƼȲȝ ɃȥǪǶǶ ǒǺƫǺ Ȥǻǻǻ ǕTS (ȯ/ȟ

ȷǻȥǺȝ ǨƠ ǦȥȥòȥƫǺ ǦŌǺÛǻ ţǺǦǩǺ ȯȥȲǶƭȲ ĘǶęǼǻ ÂǶÕÀǪǻ ȸŋ ĘŌǶǪǻ ǈǪ .*standardization* *ȄǶǪǻ ǦŌǺü*

.VS (ȯ/ ȯȥŋ 1) ÕǺǾȥȲõşǾǼǶǶǻ Ȑþ ȯȥȲȚ

ȸŋ ȟ 60 ǦǻǻǺ ƼȲȝ ɃȥǪȜ ǒǺƫǻ Ž ȯȥȲȚ .**TS** ȯ ȟ **60~ Hydrogen peroxide** ƙDZşǾǼǶǶǻ ǼǶÊõşƘǻ ȯȥȲȚ

.ǺǪǻ 1 Ōõ Ž H_2O_2

.(98 ǦǶǺÔǻ Û1963 ÛSRIP) H_2S .**Hydrogen sulfide R** ƙDZşǾǼǶǶǻ ǼǶǺȲè

.ǻǾǺǦǻ ǒǺƫǻ Ž R ƙDZşǾǼǶǶǻ ǼǶǺȲè ȸŋ ȜǦÎŀ ȯȥȲȚ .**Hydrogen sulfide TS** ƙDZşǾǼǶǶǻ ǼǶǺȲè ȯȥȲȚ

.ƘȒǶǪǻ ǯȁǺü TS ƙDZşǾǼǶǶǻ ǼǶǺȲè ȯȥȲȚ ȷȥǑǺ ȷǕ Ǽƶ .*ǦȚǵȲŋ*

[illegible] **Iodine R**، I_2 ([illegible] 1963 [illegible] 101).

[illegible] **Iodine TS**،

[illegible] 2.6 [illegible] 3 [illegible] 100 [illegible]
([illegible] 0.1).

[illegible] **Iodine 0.1** [illegible] **VS**. [illegible]
25.38 [illegible] 36.0 [illegible] KI [illegible] 1000 [illegible].

standardization [illegible] 0.1 [illegible] 25.0 [illegible]
([illegible] 0.1) VS [illegible].

[illegible] **Iodine 0.02** [illegible] **VS**. [illegible]
5.076 [illegible] 7.2 [illegible] KI [illegible] 1000 [illegible].

standardization [illegible]
VS ([illegible] 0.1) [illegible].

[illegible] **Iodine 0.01** [illegible] **VS**. [illegible]
2.538 [illegible] 3.6 [illegible] KI [illegible] 1000 [illegible].

standardization [illegible]
VS ([illegible] 0.1) [illegible].

[illegible] **Iodine bromide R**، IBr.

[illegible]

[illegible] TS (~750 [illegible]) [illegible] R [illegible]
R [illegible].

[illegible] 40 [illegible].

[illegible].

[illegible] **Iodine bromide TS**،

[illegible] 20 [illegible] R [illegible] R [illegible] 1000 [illegible].

[illegible].

[illegible] **Iron colour, strong, TS**،

[illegible] 6.6 [illegible] R [illegible] 120 [illegible] (~10 [illegible]) TS

.$FeCl_3,6H_2O$ [illegible]

[illegible] *assay* [illegible] 5.0 [illegible] 25.0 [illegible] 10.0 [illegible]

VS (1 [illegible]) [illegible] 3-2 [illegible] 60 [illegible]

15 [illegible] R [illegible] TS (100~ [illegible]) [illegible]

[illegible] 2 [illegible] VS (0.05 [illegible]) [illegible]

[illegible] TS (175 [illegible]) sulfosalicylic acid

.$FeCl_3,6H_2O$ [illegible] 13.52 [illegible] vs (0.05 [illegible]) [illegible] 1 [illegible]

.$FeCl_3,6H_2O$ [illegible] 45.0 [illegible] **Iron colour TS** [illegible]

TS [illegible] 100 [illegible] .$FeCl_3,6H_2O$ [illegible] 4.500 [illegible]

.[illegible] TS (10~ [illegible]) [illegible]

Iron standard FeTS [illegible]

[illegible] 5 [illegible] 100 [illegible] R [illegible] 0.173 [illegible]

[illegible] 1 [illegible] 1000 [illegible] TS (70~ [illegible]) [illegible]

.[illegible] 20 [illegible]

[illegible] 5.0 [illegible] **Karl Fischer reagent TS** [illegible]

[illegible] 1 [illegible] 2.5 [illegible]

.[illegible]

[illegible] anhydrous pyridine R [illegible] 100 [illegible] R [illegible] 63 [illegible]

[illegible] 32 [illegible] sulfur dioxide R [illegible]

[illegible] 500 [illegible] R [illegible]

[illegible] TS [illegible] 24 [illegible]

[illegible]

[illegible]

[illegible] 20 [illegible] *standardization* [illegible]

[illegible] TS [illegible] R [illegible]

[illegible]

[illegible] TS [illegible]

hydrated ... TS ... 1 ...

Ethylene glycol monoethyl ether R ... R

%97.0 ... **Lanthanum nitrate R** $La(NO_3)_3,6H_2O$ ... $La(NO_3)_3,6H_2O$.

assay ... 0.75 ... 25 ... 3 ... xylenol orange R ... 20 ... 3 ... TS (130~) ... VS (0.05) ... 1 ... R ... 21.65 ... VS (0.05) ... $La(NO_3)_3,6H_2O$.

Lanthanum nitrate TS ... 4.3 ... R ... 1 ... TS (130~) ... 100.

Lead, strong, PbTS ... 1 ... 100 ... 0.1598 ... R ... 5 ... TS (1000~) ... 1000.

Lead, dilute, PbTS ... 1 ... 10 ... 10 ... PbTS ... 100.

Lead acetate R $C_4H_6O_4Pb,3H_2O$ (SRIP 1963 105).

Lead acetate 80 TS ... R ... 80 ... $C_4H_6O_4Pb$ ... 0.25 ...

Lead nitrate R $Pb(NO_3)_2$ (SRIP 1963 107).

.VS 0.05 **Lead nitrate**

.1000 $Pb(NO_3)_2$ 16.56

25.0 0.05 *.standardization*

20 TS 10 200

.VS (0.05) 11

$.LiClO_4$ **.Lithium perchlorate R**

R (750~) TS

.R

.Lithium perchlorate/acetic acid TS

R1 R 10.64

.1000

R 400 .400 **.Macrogol 400 R**

.9.1 8.2 n $H(OCH_2CH_2)_nOH$

hygroscopic

R 400 2.1 *.average molecular weight*

.TS 25.0

100-96

1

0.5) 50

.TS 5 VS

15 VS (0.5)

4000

VS (0.5)

.420 380

.1.140-1.110 .(Q_{20}) *Mass density*

[illegible] 4 [illegible] 8 [illegible] *Congealing point* [illegible]

[illegible] 0.4 [illegible]

[illegible] 50 [illegible] 7.5 [illegible] 4.5 [illegible] *pH value* [illegible]

[illegible] 50 [illegible] 5.0 [illegible] *acidity or alkalinity* [illegible]

0.01) [illegible] TS [illegible]

[illegible] VS ([illegible] 0.01) [illegible] VS ([illegible]

[illegible] 2.0 [illegible]

[illegible] 10 [illegible] *sulfated ash* [illegible]

[illegible] 1 [illegible] 4 [illegible] *heavy metals* [illegible]

[illegible] 50 [illegible] 25 [illegible] TS ([illegible] 70~) [illegible]

75 [illegible] 50 [illegible] *limit of monoethylene and diethylene glycols* [illegible]

[illegible] 2-1) [illegible] 250-100 [illegible] 250 [illegible] R [illegible]

[illegible] 25 [illegible] 1 [illegible] 100 [illegible]

[illegible] 25.0

[illegible] R [illegible]

[illegible] 50 [illegible]

[illegible] 15 [illegible] 10 [illegible]

525 [illegible] 5-2 [illegible] TS [illegible]

[illegible] 10 [illegible] TS [illegible] 15 [illegible] blank [illegible]

[illegible] TS ([illegible] 400) [illegible] 10 [illegible] TS ([illegible] 400) [illegible]

[illegible] TS [illegible] 15 [illegible] R [illegible] 30 [illegible]

[illegible] 525 [illegible] 5-2 [illegible]

[illegible]

MgO **Magnesium oxide R** [illegible]

[illegible]

TS ([illegible] 750~) [illegible]

(111 [illegible] 1963 SRIP) $MgSO_4,7H_2O$ **Magnesium sulfate R** [illegible]

.(112 [illegible] 1963 SRIP) MnO_2 .**Manganese dioxide R** [illegible]

،**Manganese/silver paper R** [illegible]

15) [illegible] VS ([illegible] 0.1) [illegible] *[illegible]* [illegible] VS ([illegible] 0.1) [illegible] TS ([illegible] 15 [illegible] 1 [illegible] Whatman [illegible] .[illegible] /[illegible] .[illegible] R

[illegible] 40 [illegible] .*test for sensitivity* *[illegible]* .TS (NH4 [illegible] 10) [illegible] 1.0 ([illegible] 30 [illegible] 80 [illegible] .R [illegible] 1 [illegible] 9 [illegible] .R [illegible]/[illegible] 60-50 °[illegible] 1 [illegible]

.$MnSO_4,H_2O$ ،**Manganese sulfate R** [illegible]

.[illegible] *[illegible]*

750~) [illegible] 0.6 [illegible] 1 [illegible] *[illegible]* .TS ([illegible]

،**TS** [illegible] **15 Manganese sulfate** [illegible]

،$MnSO_4$ [illegible] 15.0 [illegible] R [illegible]

$C_2H_4O_2S$ ، **Thioglycolic acid R** [illegible] **Mercaptoacetic acid R** [illegible] .(206 [illegible] 1963 SRIP)

.(112 [illegible] 1963 SRIP) ،$C_4H_6HgO_4$ ،**Mercuric acetate R** [illegible]

،**Mercuric acetate/acetic acid TS** [illegible]

[illegible] R1 [illegible] R [illegible] 50 [illegible] *[illegible]* [illegible] TS [illegible] .[illegible] 1000 [illegible] VS ([illegible] 0.1)

.(113 [illegible] 1963 SRIP) .$HgBr_2$.**Mercuric bromide R** [illegible]

Mercuric bromide AsTS ĘǤǝÂǖǟ ǼǼŋşÀǣ ȯzŸŢ

.Ōŋ100 ǯǠǬq TS (ȯ/ȟ 750~) ȯzǬǯǠqǟ ȯzŸŢ ȸŋ ȣȣǖ ǿǟǼŌŋ Ž R ĘǤǝÂǖǟ ǼǼŋşÀǣ ȸŋ ȟ 5 ǟǟǾŀ .*ǒǟǍǍqǟ*

،**Mercuric bromide AsR** ĘǤǝÂǖǟ ǼǼŋşÀǣ ȧǿş

ǥǿǼŌŋ ȧǿzǖǟ ǦǬǠǺǭ ȷzǑǩ ȷǕ Ǣȥ .^{2}ȳ/ȟ 120-65 ȷÂǩ ǒǠÊŸŋ Ûȷ zŸǖǟ ǒǠȒǣ ǴǨǐÀǩ ȧǟǿşǕ ŌȶȞǫÊŀ .*ǒǟǍǍqǟ*

ĘȶȞǣ ÛǴǨǐÀǬǖǟ ȧǿş ȸŋ ǒǟÂǍǕ ǮŌǠŀ .400 ȝŸȝ ǞǞzÊŌŋ ÛǞǦǠÀǑǩ ǞǠǬǕ ȼǠȝ ƎȞȶǟ ȷàzǖǟ ƂǕ ǞǞȶęǿ ǦǠşǠÊŋ ǠǬŋ ȺŸȶǠǣ

ÛƆǼȞŋ Ƙȡ ÙǞǹ ȧzz ȧǿzǖǟ ĘǞǞǩş ÛǼǟǠÂǖǟ ŌǝǠÊǖǟ ȷǠǤ ÛAsTS ĘǤǝÂǖǟ ǼǼŋşÀǣ ȯzŸŢ Ž ÛȽŸŋ 25 ȸȝ ŌǬǠ ɍ Ǡŋ

.ǒzȒǖǟ ȸŋ ǞǞȶŢ ÛȤǍǞǖ ȭǠǬǩş

.ȳŸŢǖǟ Ž ǥǻşǼÊŋ ǠǿǟzȩŽ AsR ĘǤǝÂǖǟ ǼǼŋşÀǣ ȧǿş ȷÂǺŀ .*ȸǠÂǺǬǖǟ*

şǕ ǦǤǥǠǐ ǦǺÛǭ ǰǬǠŀ ȼǬȣ ǞǬzŋȣǟ ǥÀǸǕ ƂǕ şǕ ÈȶÎǖǟ ǒzȓ ƂǕ ȭǞǞǩ ȸǿǖǟ ȧǿzǖǟ ŌȶȞǫÊŀ ɍ ȷǕ Ǣȥ .*ǦŢǥŸŋ*

.ȧŸǚqǟ ȝŸȝ ǦǺÛǭ ǦǠǕ ǰǬǠŀ ɍ

،$Hg(NO_3)_2,H_2O$ ،**Mercuric nitrate R** ĘǤǝÂǖǟ ǧǟÀǬǻ

.Ǧŋǥè R ĘǤǝÂǖǟ ǧǟÀǬǻ ǾǼȞŀ .*ǠǠǾǑ*

.deliquescent ţzǞŋ Ûȷ zŸǖǟ ȤǞǠǹ ÀǠǑǕ şǕ ȒǞǕ ÛȸǿzŸǣ ȧzȞÊŋ .*ȤǑzǖǟ*

.TS (ȯ/ȟ 1000~) ŌǠǬǦǖǟ Ȁþ ȸŋ ǥǨȣǑ ǦǞȶǰ ǻzǍzǣ ǒǠţǟ Ž ǟǟşǿ .*ǦǬǥǠşǿǖǟ*

،**VS ȯ ȯzŋ 0.01 Mercuric nitrate** ĘǤǝÂǖǟ ǧǟÀǬǻ ȯzŸŢ

ŌǠǬǦǖǟ Ȁþ ȯzŸŢ ȸŋ Ōŋ 5 ȸŋ ǰǠÂŋ Ž R ĘǤǝÂǖǟ ǧǟÀǬǻ ȸŋ ÛǦǞùzǤȒŋ Ǧǭşàzŋ Ûȟ 3.5 ǦǠǟǠǥ ǟǟǾŀ .*ǒǟǍǍqǟ*

.Ōŋ 1000 ȝǿǬǥ ǒǠţǠǣ ȤǠǺŀ ÛǒǠţǟ ȸŋ Ōŋ 500ş TS (ȯ/ȟ 1000~)

ŌǠǬŀ :ǦǞǒǠǬǖǟ ǦǠǠÛǒǠǣ ȯ/ȯzŋ 0.01 ȯzŸȞȶŸǖ ĘǞęǼǖǟ ÂǞǠǬǖǟ ȸŋ ĘǠȞǬǖǟ ȽǠǠ .*standardization* *ÈǞǞǬǖǟ ǦǠǠù*

ȯzŸŢ ȸŋ Ōŋ 2ş TS (ȯ/ȟ 1000~) ŌǠǬǦǖǟ Ȁþ ȯzŸŢ ȸŋ Ōŋ 2 ȣǠȒŀş ÛǦǞùşÀƯ ǦŸǍzǥ ƂǕ Ōŋ 20.0

ȳzǞǬzŋȣǟ ǧǬǠǞèzǞ ȯzŸȞȶȩ ǠǠǠǩş Ûºȳ 20 ȸŋ ȝǿǬǠǕ ƂǕ ǞƎŀ .TS (ȯ/ȟ 45) ŌǠǼǠǼƩǟş ȳzǞǬzŋȣǟ ǧǠǠŸè

.ǨǟǠǭ ȺǿǠǣ ȷzǖ ǿzȚş ȯşǕ ƂǕ VS (ȯ/ȯzŋ 0.01)

.(114 ǦȞǠÔǖǟ Û1963 ÛSRIP) HgO **.Mercuric oxide, yellow, R** ÀǠǑȣǟ ÛĘǤǝÂǖǟ ǼǼÊǬǕ

،**Mercuric sulfate TS** ĘǤǝÂǖǟ ǧǠǠŸè ȯzŸŢ

ȸŋ Ōŋ 20 ȣǠȒŀş ÛŌǠÀȞǬǖǟ ǒǠǬǕ ÛǒǠţǟ ȸŋ Ōŋ 40 ǿǟǼŌŋ R ÀǠǑȣǟ ĘǤǝÂǖǟ ǼǼÊǬǕ ȸŋ ȟ 5 ǯÂȶŀ .*ǒǟǍǍqǟ*

.ȷǠǣşǿǖǟ ȳǠǬ ȝǿǬǥ ǭÀȞǠş ǒǠţǟ ȸŋ Ōŋ 40 ȣǠȒŀ Ż ȸŋş ÛTS (ȯ/ȟ 1760~) ŌǠǿzǠŸÊǖǟ Ȁþ ȯzŸŢ

1.0 ȸȝ ǼǠÂǠ ɍ ÛǒǠţǟ :ƂǠǬǖǟ ǼŸÛǬţǟ ȺǿǦŸ ȸǿǖǟ R ȯzǬǯȶţǟ **.Methanol, dehydrated, R** ǒǠţǟ ţşÂǞŋ ȯzǬǯȶţǟ

.ȟ/ŋŸŋ

[illegible] **Methanol R** [illegible] CH_3OH (SRIP 1963 [illegible] 117).

[illegible] **Methenamine R** [illegible] Hexamethylenetetramine [illegible] $C_6H_{12}N_4$. [illegible] 99.0% [illegible] $C_6H_{12}N_4$.

[illegible]

[illegible] (~750 [illegible]) TS.

[illegible] 2.5 [illegible] 25 [illegible] 10 [illegible] 3 [illegible] TS [illegible] 1 [illegible] (0.1 [illegible]) VS. [illegible] 10 [illegible] 3 [illegible] TS [illegible] 3 [illegible] (0.1 [illegible]) VS.

[illegible] *sulfated ash* [illegible] 0.5 [illegible].

[illegible] 1.5 [illegible] 10 [illegible] 50 [illegible] (0.5 [illegible]) VS [illegible] (1 [illegible]) VS [illegible] TS [illegible] 1 [illegible] (0.5 [illegible]) VS [illegible] 35.05 [illegible] $C_6H_{12}N_4$.

[illegible] **Methyl orange R** [illegible] 4′-dimethylaminoazobenzene-4-sufonic acid. $C_{14}H_{14}N_3NaO_3S$ (SRIP 1963 [illegible] 117).

[illegible] **Methyl orange/ethanol TS** [illegible]

[illegible] 0.04 [illegible] R [illegible] (~750 [illegible]) TS [illegible] 1000.

[illegible] **Methyl red R** [illegible] 4′-Dimethylaminobenzene-2-carboxylic acid $C_{15}H_{15}N_3O_2$ (SRIP 1963 [illegible] 118).

[illegible] **Methyl red/ethanol TS** [illegible]

[illegible] 25 [illegible] R [illegible] 0.95 [illegible] (0.05 [illegible]) [illegible] VS 5 [illegible] (~750 [illegible]) TS [illegible] (~375 [illegible]) TS [illegible] 250.

Methyl red/methylthionium chloride TS ،ÿzĘqzĘǭ ŌĘǯĘţä ǼÀøzŸõ ŌĘǯĘţä ǥÀŧǥ̆ ȯzŸŢ

Ōŋ 0.4 Ʒŋ TS (ȯ/ȟ 750~) ȯzǫÀǯÀqä Ž Ōŋ/ŋŸŋ 0.5 ÂĘõÀǬä R ŌĘǯĘţä ǥÀþ ȯzŸŢ ȸŋ Ōŋ 20 ǯÂŧł .ŏäÄDzqä

.ŏÀţä Ž Ōŋ/ŋŸŋ 20 ÂĘõÀǬä R ÿzĘqzĘǭ ŌĘǯĘţä ǼÀøzŸõ ȯzŸŢ ȸŋ

$C_{16}H_{18}ClN_3S,3H_2O$. methylene blue ƙŸĘǯĘţä Ǧęøǟ ،**Methylthionium chloride R** ÿzĘqzĘǭ ŌĘǯĘţä ǼÀøzŸõ

.(119 ǦĦÀÔöä Û1963 ÛSRIP)،

.**TS ȯ ȟ 0.2 Methylthionium chloride** ÿzĘqzĘǭ ŌĘǯĘţä ǼÀøzŸõ ȯzŸŢ

.Ōŋ 100 ǯÀǬq ŏÀţä ȸŋ ȣ ÀõøäǼŌŋ Ž R ÿzĘqzĘǭ ŌĘǯĘţä ǼÀøzŸõ ȸŋŸŋ 23 ǯÂŧł .ŏäÄDzqä

C.I. Û11 Ǩǫäåøzŋ åzèÛ C.I. . Eriochrome black R ÿşÀõzÀøÛ åzèÛ **Mordant Black 11 R** Ǩǫäåøzŋ åzèÛ

2-(2-hydroxy-6- Ĉøȯ Ƀåzôöä ǴŸţä ÜSolochrome Black ÿşÀõzȯzè åzèÛ ÛT ÿşÀõzÀøÛ åzèÛ Û14645 ḽęø

.(84 ǦĦÀÔöä Û1963 ÛSRIP) $C_{20}H_{12}N_3NaO_7S$ Ûnitro-4-sulfo-1-naphthylazo)-1-naphtol،

،**Mordant Black 11 indicator mixture R** Ǩǫäåøzŋ åzèÛ ÀĦÎŧ ǰÀÂŋ

.R ÿzÀåzÔöä ǼÀøzŸõ ȸŋ ȟ 100 Ʒŋ R 11 Ǩǫäåøzŋ åzèÛ ȸŋ ȟ 1 ǯÂŧł .ŏäÄDzqä

.(122 ǦĦÀÔöä Û1963 ÛSRIP) .$C_{10}H_8O$. ß-naphthol R ȯzǯÀþ ÀǬĘä **2-Naphthol R** ȯzǯÀþ–2،

.**2-Naphthol TS1** ȯzǯÀþ–2 ȯzŸŢ،

(ȯ/ȟ 80~) ÿzÀåzÔöä ǼĘÊõşøǼĿ ȯzŸŢ Ōŋ 40 Ž ÛǯÀǵ ȼøzŸä ǼĘƷ ÛR ȯzǯÀþ–2 ȸŋ ȟ 5 äøÀł .ŏäÄDzqä

.Ōŋ 100 ǯÀǬq ŏÀţä ȸŋ ȣÀõ øäǼŌŋ ȣÀȒŀş TS

.ƘȒĦǬöä ǬÀǵ TS1 ȯzǯÀþ–2 ȯzŸŢ ȷzÒÀ ȷÛ Ƶz :ǴŢǵŸŋ

ǦĦÀÔöä Û1963 ÛSRIP) . R (Ǧəţä Ž 70) ŌÀÀǬȸöä Ȑþ **TS ȯ ȟ 1000~ Nitric acid** ŌÀÀǬȸöä Ȑþ ȯzŸŢ

.d~1.14 Ü(125

،**TS ȯ ȟ 130~ Nitric acid** ŌÀÀǬȸöä Ȑþ ȯzŸŢ

Àŋ) Ōŋ 1000 ǯÀǬq ŏÀţä ȸŋ ȣÀõ øäǼŌŋ TS(ȯ/ȟ 1000~) ŌÀÀǬȸöä Ȑþ ȯzŸŢ ȸŋ Ōŋ 130 ȤäÁł .ŏäÄDzqä

.d~1.07 Ü(ȯ/ȯzŋ 2 äøÀÔł

،**TS ȯ ȟ 15~ Nitric acid** ŌÀÀǬȸöä Ȑþ ȯzŸŢ

.HNO_3 ȸŋ ȯ/ȟ 15.0 ȾŸƷ ɃzǬĦĘö ŏÀţÀä ȤäÁŧ Û TS(ȯ/ȟ 1000~) ŌÀÀǬȸöä Ȑþ ȯzŸŢ .ŏäÄDzqä

،**TS ȯ ȟ 3~ Nitric acid** ŌÀÀǬȸöä Ȑþ ȯzŸŢ

.HNO_3 ȸŋ ȯ/ȟ 3.0 ȾŸƷ ɃzǬĦĘö ŏÀţÀä ȤäÁŧ Û TS(ȯ/ȟ 1000~) ŌÀÀǬȸöä Ȑþ ȯzŸŢ .ŏäÄDzqä

.(128 ǦĦÀÔöä Û1963 ÛSRIP) $C_6H_5NO_2$ ،**Nitrobenzene R** ȸÀÂÁŧşÀǬÀöä

.(129 [illegible] 1963 SRIP) N_2 ،R [illegible]

(132 [illegible] 1963 SRIP) ،**Pancreatic digest of casein R** [illegible]

.(135 [illegible] 1963 SRIP) .**Papaic digest of soybean meal R** [illegible]

.(135 [illegible] 1963 SRIP) .**Paraffin, liquid, R** [illegible]

[illegible] enzyme [illegible] .**Penicillinase R** [illegible] *Bacillus cereus* [illegible] thiazolidine [illegible] (750~ [illegible]) TS [illegible] R [illegible] .ethyl acetate R [illegible] R [illegible] ."Preparation of penicillinase [illegible]"

[illegible]

[illegible]

[illegible] 2.7 [illegible] R [illegible] 10 [illegible] .*Preparation of penicillinase* [illegible] 200 [illegible] R [illegible] 5.9 [illegible] R [illegible] 0.4 [illegible] 1000 [illegible] TS (200~) [illegible] 7.2 [illegible] TS (1) [illegible] 1 [illegible] 5 [illegible] R [illegible] 10 [illegible] NCTC 9946 *Bacillus cereus* [illegible] 37-35 [illegible] 37-18 [illegible] 16 [illegible].

.R [illegible] .**Penicillinase TS** [illegible]

[illegible] ."Penicillinase assay [illegible]" TS [illegible] 36 [illegible].

[illegible] .*Penicillinase assay* [illegible] .°1 ± 30 [illegible] 20 [illegible] 15 [illegible] borosilicate glass

.ȯẢȶĤǪȅȓ ǑǦę ◦ȳ 30 ǥǿȁÀШ Ɀ ȉȁǯȮȁ ȜƐƤ ɹǯȮǩ ɹǕ

ȸȵ Ǭȵ 0.4 Ûgelatin TS ȳŸTȁ ȯǯŸȚ ȸȵ Ǭȵ 1.6 :ƂȀǪȁ ǼƐǨȀǪȁ Ȩǯȿ ǿȀǦǪǹȓȁ ȁǯǦǪǕ ƂǕ Ɀ ȉȁǯȮȁ ȣȀȒǩ ÛTS ƙŸÊȀǦȁ ǑȀȀǨȁ ȳǯȀẳǯȍ ȯǯŸȚ ȸȵ Ǭȵ 1ȿ ÛTS ȀÎȀȁ ȯǯŸȚ ȸȵ ǥȀÛę 1 ÛǮǿȀǦǪǹȁ ẳȁȀȶȁ TS ȁȀȀƐŸÊȀǦȁ ȯǯŸȚ ẳǯƐȁ ȯǯŸȚ ȸȵ Ǭȵ 2.0 ȣȀȒǩ ǦƐȀȀǪ 15 ǼĤȁȿ ǦǪęȗȶȁ ǦȝȀÊȁ ȨŸÛǨ .Ǭȵ 1 ȴDzШ ȌȮư ȸȵ ƘǹȷȁƑ Ɀ ȉȀȮȁ ÑȀȀǩ .TS ƙŸÊȀǦȁ ǑȀȀǨȁ ȳǯȀẳǯȍ ȯǯŸȚ ǦǯȀȑǕ ȸȵȁ ȸȵ ȁǿȀǦǪȝȁ ẳǯƐȁ ɹǯǐ ƫȀǪ ȸȵȁ ǑDzÊǩ ÛVS (ȯ/ȯǯȵ 0.01) ȓȀÎǪ Ȝȵ ȔǦȒȁȀȁ ǦƐȀȀǪ 36 ȯŸǹ ɹǯŸȁ ƫȀǪ ȸȵȁ Ȩǯȁǯ ǪȀ .ǦÊȀȀȮȶȁ ǰȁȀǪ ȸȵ TS ȁȀȀƐŸÊȀǦȁ ȯǯŸȚ ȓȀÎǪ ǼÊĤǩ ǦȝȀÊȁ Ž R ƙŸƐÊȀǦȁ ǑȀȀǨȁ ȳǯȀẳǯȍ ȸȵ ȠŸȵ 220 (7.0 ǒȀȽȀȁ Ž ◦ȳ 30 ǦDZǿǼȁȀȁ) ȬȮȀǨ ȯǼĤȶ ȕǯȀȮȶȁ ȁȀȀƐŸÊȀǦȁ .TS ȁȀȀƐŸÊȀǦȁ ȯǯŸȚ ȸȵ Ǭȵ 1 ǬȮǒ

Ž ȘȀĤǩȿ ǼȶDzǪȁ ǦȁȀǵ Ž ǯȽȿ ⱫȀDzǩ ȀȵǼȀȝ .ȳȀȀǕ 3-2 ȯŸǹ ǬȶĤǪÊǩȿ ◦ȳ 2ȿ 0 ƙȁ ǦDZǿǼȁȀȁ ɹÂÅǩ .*ȸȀÂǺǪȁ* .ȀƬȉǕ ǥǼĤȍ ȁȀȀƐŸÊȀǦȁ ȯǯŸȚ ɹȀÅǩ ɹǕ ȸȮȶƐǯ ÛǦȵǯǪƯ ǧȓǯǦȵǕ

.(137 ǦĤȀÔȁ Û1963 ÛSRIP) ،**Peptone, dried, R** ⱫȀDzȶȁ Ûɹǯ ǪǦǦȁ

0.02 ȥŸȝ Ƀǯ Ǫǂȁȿ ǥǼȍǯȶȀȁ ȴǬĤȶȁ ȯǯŸǂȁ ɹǯȮȀ :ƂȀǪȁ ǼŸÛǪȶȁ ɄǿǦŸǩ R ⱫȀDzȵ ɹǯǪǦȁ .**Peptone R1** ɹǯ ǪǦǦȁ .ȀǦȀȀǑǩ ȉȓẳȀĤǪȵ ȿǕ ȉȓẳȀĤǪȵȿ ȀƐǯȀȍ Ǭȵ/ȟ

،**TS ȯ ȟ 5 Peptone** ɹǯǪǦǦȁ ȯǯŸȚ

ⱫȀƩȿ R ȳǯȀẳǯÔȁ ǼȀǿǯŸȭ ȸȵ ȟ 7ȿ ÛƙÅÊǪȁ Ȝȵ ÛǒȀȶȁ Ž R ⱫȀDzȶȁ ɹǯǪǦǦȁ ȸȵ ȟ 5.0 ȁȁǾǩ .*ȯȁÄDZq* ȥǿǪǵ ȯǼĤǩ ÛǴȉÄǩ .ǦǬƐęẳ 20 ǥǼȵ ȥŸȣǩȿ 8.4 - 8.0 ǒȀȽȀȁ ȥǿǪǵ ȯǼĤǩ .Ǭȵ 1000 ȝȀǪȹ ǒȀȶȁ ȸȵ ȣȀȭ ǿȁǼǬȵ .ǦǬƐęẳ 30 ǥǼȵ ◦ȳ 115 ǦDZǿǼȁȀȁ ȻȚȀШ ȴǬĤǩȿ Û7.4 - 7.2 ǒȀȽȀȁ

،**TS1 ȯ ȟ 1 Peptone** ɹǯǪǦǦȁ ȯǯŸȚ

ǒȀȶȁ ȸȵ ȣȀȭ ǿȁǼǬȵ Ž (Ʉǿǯǥ ǰƐÊǪ ƙÊǦȁ ǦȵȀȒȽ ȻȁÎǩ Ȁȵ ȿǕ) R1 ɹǯǪǦǦȁ ȸȵ ȟ 1.0 ȁȁǾǩ .*ȯȁÄDZq* ǦƐȝȿǕ Ž ȳȀÊęǕ ȥŸȝ Ǭȵ 100 Ȝȑǯǩ Û0.2 ± 7.1 ǒȀȽȀǦȁ ƂǕ ȯǼĤǩ ÛƐǯȀȍ ǴǦÔƐ ǾȀȀǩ ȿǕ ǴȉÄǩ ÛǬȵ 1000 ȝȀǪȹ .ǦǬƐęẳ 20 - 18 ǥǼȵ ◦ȳ 121 ǦDZǿǼȁȀȁ ȘȀΣȀȁ ȴǬĤǩȿ ÛǦȀẳȀǯ

،**TS2 ȯ ȟ 1 Peptone** ɹǯǪǦǦȁ ȯǯŸȚ

ǿȁǼǬȵ ⱫȀƩȿ R ȳǯȀẳǯÔȁ ǼȀǿǯŸȭ ȸȵ ȟ 9ȿ ÛƙÅÊǪȁ Ȝȵ ÛǒȀȶȁ Ž R ȣȀƨȁ ɹǯǪǦǦȁ ȸȵ ȟ 1.0 ȁȁǾǩ .*ȯȁÄDZq* ǒȀȽȀȁ ƂǕ ȯǼĤǩ ÛǴȉÄǩ .ǦǬƐęẳ 20 ǥǼȵ ȥŸȣǩȿ 8.4 - 8.0 ǒȀȽȀȁ ȥǿǪǵ ȯǼĤǩ .Ǭȵ 1000 ȝȀǪȹ ǒȀȶǿȁ ȸȵ ȣȀȭ .ǦǬƐęẳ 30 ǥǼȵ ◦ȳ 115 ǦDZǿǼȁȀȁ ȘȀΣȀȁ ȴǬĤǩȿ Û7.4 - 7.2

. R(ɹȁȿ/ɹȁȿ ǦȀȶȁ Ž 70) ȬȀǿǯŸȭƘǦȁ Ȑƥ ،**TS ȯ ȟ 1170~ Perchloric acid** ȬȀǿǯŸȭƘǦȁ Ȑƥ ȯǯŸȚ .*d*~1.67 Ǖ(137 ǦĤȀÔȁ Û1963 ÛSRIP)

ÛTS (ὀ/ȟ 1170~) ÕǁǿƺŸõƘǴä Ȑƥ ὀƺŸƬ ،**TS ὀ ȟ 140~ Perchloric acid** ÕǁǿƺŸõƘǴä Ȑƥ ὀƺŸƬ

.*d*~1.09 Û$HClO_4$ ȡƞ ὀ/ȟ 141 ʔŸʒ ɃƺǪǶǶö ŏÀƫÀǽ ǺÀǺÀǺÀȴ

،**VS ὀ ὀƺƞ 0.1 Perchloric acid** ÕǁǿƺŸõƘǴä Ȑƥ ὀƺŸƬ

ȡƞ Ōƞ 8.2 ǿäǼŌƞ Û°ÿ 25 ǦääÀǥ ǥǿäÀǵ ǦDZǿá Ž ÛR1 ɄDzŸǯöä ÕǪȇȅȷä Ȑƥ ȡƞ Ōƞ 900 БÛ ȣÀŘł .*öäÀDZqä*

acetic anhydride ÕǪȇȅȷä ǼǁǿǼȆǢÛ ȡƞ Ōƞ 32 ȣÀŘłş ÛʒÂŧł ÛTS (ὀ/ȟ 1170~) ÕǁǿƺŸõƘǴä Ȑƥ ὀƺŸƬ

ʒÀǪǫɋ ÛR1 ɄDzŸǯöä ÕǪȇȅȷä Ȑƥ ȡƞ ǭȣÀõ ǿäǼŌƞ ȣÀŘł ÛǦƺÀ8öä ǥǿäÀǵ ǦDZǿá БÛ áƎł .ǦȇǪÀǫ ʒÂŧłş ÛR

.Ǧʒȅ 24 ǥǼƞ ǿäÀŌǪȅŸö õÀǪş ÛŌƞ 1000

ǼǁǿǼȆǢÛ şÛ ŏÀƫä ȡƞ ȣÀõ ǿäǼŌƞ ȣÀŘł .ǺǁǿşÀȑ Õöǽ ȷÀõ äǽÛ .ÀÎȇƺ ὀǿÀõ ǦÕǁÀÛǽ ʔƺǪǂä ȡǂǂł .*water ŏÀƫä*

.ǦȇƺÀȑÛ Ǧʒȅ 24 ǥǼƞ ǿäÀŌǪȅŸö õÀǪłş ÛŌƞ/ƞŸƞ 0.2ş 0.1 Ƙǽ ŏÀƫä ȡƞ ʔƺǪǂä ÙǦŘö R ÕǪȇȅȷä

ǧɍÀǯƺ ȡƞ ÛǦȇüƺǴŘƞ Ǧǫşàƺƞ Ûȟ 0.5 ǥÀÀÀȞŧȇ ȨȇȩǼöä ÂȇõÀǪöä ȡƞ ȨŌǶǪöä ǈǪ .*standardization ȄȇǪǪöä ǦÕǁÀü*

ÛǦʒÀȅ 2 ǥǼƞ °ÿ 120 ǦDZǿǼöÀǽ ȊÕǴȆȴ ǦÀÀDZƫä Û*potassium hydrogen phthalate* R ÿƺȇȅÀǩƺǴöş ƘDZşǿǼŦä

Û"*Non-aqueous titration ɄǶȷƞŸöä Ùȅƺöá Ž ǥÀÀȞƫä*" ȷäƺʒ ƘƠ ȣƺòƺƞ ƺȽ ÀŧõÛA ǦÕǁÀÛöä ÿäǼÁǪȅÀǽ

ȡƞ ƞŸƞ 20.42 üƺÀȮł VS (ὀ/ὀƺƞ 0.1) ÕǁǿƺŸõƘǴä Ȑƥ ὀƺŸƬ ȡƞ Ōƞ 1 Ōõ .127 ǦǶÀÔöä ÀȚǫä

.ÀȚȇƺ ȄȇǪǪöä ŏäÀDZÛ Ź ɄǿǪöä ǥǿäÀƩä ǦDZǿá ŌDzȆł .$C_8H_5KO_4$

.(108 ǦǶÀÔöä Û1963 ÛSRIP) . light petroleum R ȤȇÀǹ ὀşÀǪǽ **Petroleum, light, R** ȤȇÀƪä ÛὀşÀǪǴöä

.(138ǦǶÀÔöä Û1963 ÛSRIP) $C_{12}H_8N_2$, H_2O Û1,10-Phenanthroline ،***o*-Phenanthroline R** ƘöşÀǯǫÀȇƺ ƺǫǿşÛ

،**TS ὀ ȟ 1 *o*-Phenanthroline** ƘöşÀǯǫÀȇƺ ƺǫǿşÛ ὀƺŸƬ

.Ōƞ 100 ʒÀǪǫɋ ŏÀƫä ȡƞ ǭȣÀõ ǿäǼŌƞ Ž R ƘöşÀǯǫÀȇƺ ƺǫǿşÛ ȡƞ ȟ 0.11 ääØł ،*öäÀDZqä*

،***o*-Phenanthroline TS** ƘöşÀǯǫÀȇƺ ƺǫǿşÛ ὀƺŸƬ

ȡƞ ȟ 1.5 ǦääÀǥ ȣÀŘł ÛŏÀƫä ȡƞ Ōƞ 70 ǦääÀǥ Ž ferrous sulfate R äşǼǁǼƩä ǧÀÀŸȅ ȡƞ ȟ 0.7 ääØł ،*öäÀDZqä*

.Ōƞ 100 ʒÀǪǫɋ ŏÀƫä ȡƞ ǭȣÀõ ǿäǼŌƞş R ƘöşÀǯǫÀȇƺ ƺǫǿşÛ

،C_6H_6O ،**Phenol R** ὀƺǼÀöä

ÛǦǶǿäÀöä ÛȊǴǁÀŌǩ ȤȇÀǹ ɄŸÀǫÀǥ ȷƺŸǽ şÛ ÛȷƺŸöä ǦƺǼʒ ÛǦÕȅÀŧǪƞ şÛ ǦŸÔÀȺ ǦǁÀää ǧäǿƺǽä şÛ ǦǁǿƺŸǽ ŌǪõ .*Ȥòƺöä*

.ǦȇüÀǺƫä ǦȇÎǳȷäş ǼŸƨä äƺǶȉ ǼǴȆł ÛǦõÀõÛ .ǥÂȇŧȴ

ὀƺŸƬ Ž ȷÀşǿöä ǥÀǵ ÛR ŌõÊöä ƘƺäÀǶöä ȡƞ ŏÂDZ 100 ǦääÀǥ Žş ŏÀƫä ȡƞ ȊÂDZ 15 ǦääÀǥ Ž ǦääşǼ .*ǦǪÀǽşǾöä*

.R ÿǿƺƺşǿƺŸÕöäş R Ƙǫȷäş TS (ὀ/ȟ 750~) ὀƺǪÀʒǁɋä

.°ÿ 15 ǥǿäÀǵ ǦDZǿá Ž ŏÀƫä ȡƞ Ōƞ 15 Ž ȊŸƞÀõ ȟ 1.0 äşØǁ .*Completenss of solution ὀƺŸǂä ǦȇõÀŧõ*

.°ÿ 40.5 ȸ Ȫ̈Ȫ ɟ .*congealing temperature ǻǿȶƠɍ ǥǿȁǥ ǦǲǿǻǺ*

ǦǲǿǻǺ Ž Ǩǣǽ̈ǿ ȷàȥǿ ʡøǥ Ȥǽǲʪ ɄǝǾ ÿǽþ ʡǷȝ ǟǺǼ .*residue on evaporation ǨǺǥǿ ȸ ǦǿǺȶǿ*

.ǦǿǺȶǿ ȸ ȟ/ȵǷȵ 0.5 ȸ ǼǠǺ Ǻȵ ȭǺ ɟ °ÿ 105 ǥǿǟǥ

.(139 ǦǺǻȫǿ Û1963 ÛSRIP) $C_{20}H_{14}O_4$.**Phenolphthalein R** ƙǺǿǻ ȯȥǽǺǿ

،Phenolphthalein/ethanol TS ȯȥǿǽǻq ƙǺǿǻ ȯȥǽǺǿ ȯȥǷȚ

.Ȫȵ100 ȝǺǽq TS (ȯ/ȟ750~) ȯȥǿǽǻq ȯȥǷȚ ȸ ȣȣǺȭ ǿǽǼȵ Ž R ƙǺǿǻ ȯȥǽǺǿ ȸ ȟ 1.0 ǡǽǾ .*ǿǽǲǻq*

،Phenolphthalein/pyridine TS ȸǽǼǽǦǿ ƙǺǿǻ ȯȥǽǺǿ ȯȥǷȚ

.Ȫȵ 100 ȝǺǽq R ȸǽǼǽǦǿ ȯȥǷȚ ȸ ȣȣǺȭ ǿǽǼȵ Ž R ƙǺǿǻ ȯȥǽǺǿ ȸ ȟ 1.0 ǡǽǾ .*ǿǽǲǻq*

Û1963 ÛSRIP) $C_{19}H_{14}O_5S$ ÛPhenolsulfonphthalein ƙǺǿǻ ȷȥǷȆ ȯȥǽȥ ،**Phenol red R** ȯȥǽǺǿ ǥǺȶǥ

.(139 ǦǺǻȫǿ

،Phenol red/ethanol TS ȯȥǿǽǻq ȯȥǽǺǿ ǥǺȶǥ ȯȥǷȚ

0.05) ÿȥǽǻȫǿ ǼǾȆȭʂǿǼȽ ȯȥǷȚ ȸ Ȫȵ 2.85 ȸ ȷǺȵ Ž R ȯȥǽǺǿ ǥǺȶǥ ȸ ȟ 0.05 ǡǽǾ .*ǿǽǲǻq*

ǿǽǼȵ ȤǺǺǼ ǼǽƎǺǿ ǼǾǽʂ ȤÛǷǽ ȯȥǷǂ ȸǺǼǼ .TS (ȯ/ȟ 750~) ȯȥǿǽǻq ȯȥǷȚ ȸ Ȫȵ 5ʂ VS (ȯ/ȯȥȵ

.Ȫȵ 250 ȝǺǽq TS (ȯ/ȟ 150~) ȯȥǿǽǻq ȯȥǷȚ ȸ ȣȣǺȭ

،(Phosphate buffer, sterile, pH 4.5, TS) TS Û4.5 ȯǺǼǺ ÛȴǽǾǿ ÛǧǺǺȆǺǿ ǦǿǻǺ ȯȥǷȚ

Ž potassium dihydrogen phosphate R ÿȥǼȅǺȥǦǿʂ ƙǲʂǿǼȚǿ ǦǼǿǺ ǧǺǺȆ ȸ ȟ 13.6 ǡǽǾ .*ǿǽǲǻq*

ȷǺȭ ǿǽÛ Û°ÿ 120 ǥǿǟǥ ǦǲǿǻǺ Ž ǥǼȯȥȶǿ Ž ǦǾǿǻǺ 20 ǥǼȵ ȯȥǷǂǿ ȴǾǼ .Ȫȵ 1000 ȝǺǽq ǿǺȶǿ ȸ ȣȣǺȭ ǿǽǼȵ

ȯȥǷȚ ʂǽ TS (ȯ/ȟ 1440~) ȬǽǿȥǺȆǺǿ ȐþȯȥǷȫȶȆ 4.55 - 4.45 ƂǽǿǺǼǦǿ ȯǼǼ ÛǺǿʂǺȑ Ȭǿǽ

.TS (ȯ/ȟ 110~) ÿȥǼȅǺȥǦǿ ǼǾȆȭʂǿǼȽ

.ȯȥǷǂǿ ȴǾǼ ȪǦʂ ÛǺǿʂǺȑ Ȭǿǽ ȷǺȭ ǿǽÛ ÛpH ǿǺǼǦǿ ȬǽǼǼ ǺǲǺǼ ȷǽ Ǽʐ .*ǦȚǥŸȵ*

،(Phosphate buffer, sterile, pH 6.0, TS1) TS1 Û6.0 ȯǺǼǺ ÛȴǽǾǿ ÛǧǺǺȆǺǿ ǦǿǻǺ ȯȥǷȚ

ȟ8.0ʂ dipotassium hydrogen phosphate R ÿȥǼȅǺȥǦǿ ǦǼǿǺ ƙǲʂǿǼȚǿ ǧǺǺȆ ȸ ȟ2.0 ǡǽǾ .*ǿǽǲǻq*

ȝǺǽq ǿǺȶǿ ȸ ȣȣǺȭ ǿǽǼȵ Ž potassium dihydrogen phosphate R ÿȥǼȅǺȥǦǿʂ ƙǲʂǿǼȚǿ ǦǼǿǺ ǧǺǺȆ ȸ

ǿǺǼǦǿ ȯǼǼǽ ÛǺǿʂǺȑ Ȭǿǽ ȷǺȭ ǿǽÛ Û°ÿ 120 ǥǿǟǥ ǦǲǿǻǺ Ž ǥǼȯȥȶǿ Ž ǦǾǿǻǺ 20 ǥǼȵ ȯȥǷǂǿ ȴǾǼ .Ȫȵ 1000

(ȯ/ȟ110~) ÿȥǼȅǺȥǦǿ ǼǾȆȭʂǿǼȽ ȯȥǷȚ ʂǽ TS (ȯ/ȟ 1440~) ȬǽǿȥǺȆǺǿ ȐþȯȥǷȫȶȆ 6.05 - 5.95 Ƃǽ

.TS

.ȯȥǷǂǿ ȴǾǼ ȪǦʂ ÛǺǿʂǺȑ Ȭǿǽ ȷǺȭ ǿǽÛ ÛpH ǿǺǼǦǿ ȬǽǼǼ ǺǲǺǼ ȷǽ Ǽʐ .*ǦȚǥŸȵ*

،**(Phosphate buffer, sterile, pH 6.0, TS2) TS2** Û**6.0** ŏÀŁÀæ ÛɭĒÕĤŏä Ûğ ÀÀÊÀŏä Ǧəøäå ȯʐŸʈ

anhydrous disodium hydrogen ǦĒəÀŋ¥ŏä ÿʐÀåʐÔŏä ǦĒəÀÀþ ƙDZşøÆĒTä ğÀÀÊɀ ȸŋ ȟ 1.16 ā äØł .*ŏäÄDZqâ*

Ž potassium dihydrogen phosphate R ÿʐĒèÀkʐǦŏäş ƙDZşøÆĒTä ǦĒəÀÀþ ğÀÀÊɀ ȸŋ ȟ 7.96ş phosphate R

ȷÀõ äæÜ Û°ÿ 120 ġøäÀǵ ǦDZøå Ž ġÆÈòʐʈä Ž ǦÕĒęå 20 ġÆŋ ȯʐŸǂä ɭÕĤł .Õŋ 1000 ʓÀQþɋ ŏÀʈä ȸŋ ɐȣÀõ øäÆÕŋ

ȯʐŸʈ şÜ TS (ȯ/ȟ 1440~) ÕÀøʐÀÊÀŏä Ȑþ ȯʐŸĦʉɫê 6.05 - 5.95 БÜ ŏÀŁÀǦŏä ȯÆĤł ÛÀÀøşÀȓ Õŏæ

.TS (ȯ/ȟ 110~) ÿʐĒèÀkʐǦŏä ÆĒÊõşøÆĒŁ

.ȯʐŸǂä ɭÕĤǩ ÕǦę ÛÀÀøşÀȓ Õŏæ ȷÀõ äæÜ ÛpH ŏÀŁÀǦŏä ÕÀÆĤǩ ÂDzÀł ȷÜ Æʑ .*ǦȚǵŸŋ*

،**(Phosphate buffer, sterile, pH 6.0, TS3) TS3** Û**6.0** ŏÀŁÀæ ÛɭĒÕĤŏä Ûğ ÀÀÊÀŏä Ǧəøäå ȯʐŸʈ

ȟ8.0ş dipotassium hydrogen phosphate R ÿʐĒèÀkʐǦŏä ǦĒəÀÀþ ƙDZşøÆĒTä ğÀÀÊɀ ȸŋ ȟ 20.0 ā äØł .*ŏäÄDZqâ*

ʓÀQþɋ ŏÀʈä ȸŋ ɐȣÀõ øäÆÕŋ Ž potassium dihydrogen phosphate R ÿʐĒèÀkʐǦŏäş ƙDZşøÆĒTä ǦĒəÀÀþ ğÀÀÊɀ ȸŋ

ŏÀŁÀǦŏä ȯÆĤł ÛÀÀøşÀȓ Õŏæ ȷÀõ äæÜ Û°ÿ 120 ġøäÀǵ ǦDZøå Ž ġÆÈòʐʈä Ž ǦÕĒęå 20 ġÆŋ ȯʐŸǂä ɭÕĤł .Õŋ 1000

(ȯ/ȟ 110~) ÿʐĒèÀkʐǦŏä ÆĒÊõşøÆĒŁ ȯʐŸʈ şÜ TS (ȯ/ȟ 1440~) ÕÀøʐÀÊÀŏä Ȑþ ȯʐŸĦʉɫê 6.05 - 5.95 БÜ

.TS

.ȯʐŸǂä ɭÕĤǩ ÕǦę ÛÀÀøşÀȓ Õŏæ ȷÀõ äæÜ ÛpH ŏÀŁÀǦŏä ÕÀÆĤǩ ÂDzÀł ȷÜ Æʑ .*ǦȚǵŸŋ*

،**(Phosphate standard buffer, pH 6.8, TS) TS** Û**6.8** ŏÀŁÀæ Ûğ ÀÀÊÀŏä ɃøÀÆĤŋ Ǧəøäå ȯʐŸʈ

potassium dihydrogen phosphate R ÿʐĒèÀkʐǦŏäş ƙDZşøÆĒTä ǦĒəÀÀþ ğÀÀÊɀ ȸŋ ȟ 3.40 ā äØł .*ŏäÄDZqâ*

Ž anhydrous disodium hydrogen phosphate R ǦĒəÀŋ¥ŏä ÿʐÀåʐÔŏä ǦĒəÀÀþ ƙDZşøÆĒTä ğÀÀÊɀ ȸŋ ȟ 3.53ş

.Õŋ 1000 ʓÀQþɋ ȷʐäÀÒŏä ÆĒÊõÀ ɄəÀÀþ ȸŋ БÀʅä ŏÀʈä ȸŋ ɐȣÀõ øäÆÕŋ

،**(Phosphate buffer, pH 7.0, TS) TS** Û**7.0** ŏÀŁÀæ Ûğ ÀÀÊÀŏä Ǧəøäå ȯʐŸʈ

anhydrous disodium hydrogen ǦĒəÀŋ¥ŏä ÿʐÀåʐÔŏä ǦĒəÀÀþ ƙDZşøÆĒTä ğÀÀÊɀ ȸŋ ȟ 5.76 ā äØł .*ŏäÄDZqâ*

Ž potassium dihydrogen phosphate R ÿʐĒèÀkʐǦŏäş ƙDZşøÆĒTä ǦĒəÀÀþ ğÀÀÊɀ ȸŋ ȟ 3.53ş phosphate R

.Õŋ 1000 ʓÀQþɋ ȷʐäÀÒŏä ÆĒÊõÀ ɄəÀÀþ ȸŋ БÀʅä ŏÀʈä ȸŋ ɐȣÀõ øäÆÕŋ

،**(Phosphate buffer, sterile, pH 7.0, TS) TS** Û**7.0** ŏÀŁÀæ ÛɭĒÕĤŏä Ûğ ÀÀÊÀŏä Ǧəøäå ȯʐŸʈ

anhydrous disodium hydrogen ǦĒəÀŋ¥ŏä ÿʐÀåʐÔŏä ǦĒəÀÀþ ƙDZşøÆĒTä ğÀÀÊɀ ȸŋ ȟ 5.76 ā äØł .*ŏäÄDZqâ*

Ž potassium dihydrogen phosphate R ÿʐĒèÀkʐǦŏäş ƙDZşøÆĒTä ǦĒəÀÀþ ğÀÀÊɀ ȸŋ ȟ 3.55ş phosphate R

ȷÀõ äæÜ Û°ÿ 120 ġøäÀǵ ǦDZøå Ž ġÆÈòʐʈä Ž ǦÕĒęå 20 ġÆŋ ȯʐŸǂä ɭÕĤł .Õŋ 1000 ʓÀQþɋ ŏÀʈä ȸŋ ɐȣÀõ øäÆÕŋ

ȯʐŸʈ şÜ TS (ȯ/ȟ 1440~) ÕÀøʐÀÊÀŏä Ȑþ ȯʐŸĦʉɫê 7.05 - 6.95 БÜ ŏÀŁÀǦŏä ȯÆĤł ÛÀÀøşÀȓ Õŏæ

.TS (ȯ/ȟ 110~) [illegible]

.[illegible] pH [illegible]

(Phosphate buffer, sterile, pH 7.2, TS) TS [illegible] **7.2** [illegible]

ȟ1.4ş potassium dihydrogen phosphate R [illegible] 6.80 [illegible] R [illegible] 1000 [illegible] 20 [illegible] 1440~) [illegible] 7.3 - 7.1 [illegible] 120 [illegible] .TS (ȯ/ȟ 110~) [illegible] TS (ȯ/ȟ

.[illegible] pH [illegible]

(Phosphate standard buffer, pH 7.4, TS) TS [illegible] **7.4** [illegible]

potassium dihydrogen phosphate R [illegible] 1.18 [illegible] anhydrous disodium hydrogen phosphate R [illegible] 4.30ş [illegible] 1000 [illegible]

(Phosphate buffer, sterile, pH 8.0, TS1) TS1 [illegible] **8.0** [illegible]

dipotassium hydrogen phosphate R [illegible] 16.73 [illegible] potassium dihydrogen phosphate R [illegible] 0.52ş [illegible] 120 [illegible] 20 [illegible] 1000 [illegible] TS (ȯ/ȟ 1440~) [illegible] 8.1-7.9 [illegible] .TS (ȯ/ȟ 110~)

.[illegible] pH [illegible]

(Phosphate buffer, sterile, pH 8.0,TS2) TS2 [illegible] **8.0** [illegible]

anhydrous disodium hydrogen [illegible] 8.95 [illegible] potassium dihydrogen phosphate R [illegible] 0.50ş phosphate R [illegible] 120 [illegible] 20 [illegible] 1000 [illegible] TS (ȯ/ȟ 1440~) [illegible] 8.1 - 7.9 [illegible] .TS (ȯ/ȟ 110~) [illegible]

.[illegible] pH [illegible]

[illegible] (141 [illegible] 1963 [illegible] SRIP) ، R [illegible] **TS ȯ ȟ1440~ Phosphoric acid** [illegible]

.d~1.7

.(142 1963 SRIP) P_2O_5 .**Phosphorus pentoxide R**

$C_8H_4O_3$.**Phthalic anhydride R**

TS (750~)

.R

130 °.

Phthalic anhydride/pyridine TS

R 300 R 42 .

R 1

1000 .

TS /

.(Polysorbate 80 R) R 80 oleic acid

.tripolyethylene-glycol 300-sorbitan ether

.miscibility

R TS (750~)

.(144 1963 SRIP) $C_2H_3KO_2$.**Potassium acetate R**

.**Potassium acetate TS**

1000 R R 100 .

.(145 1963 SRIP) $KHCO_3$.**Potassium bicarbonate R**

.(148 1963 SRIP) KBr .**Potassium bromide R**

R .**Potassium bromide IR**

3

45 "Spectrophotometry in the infrared region

670 - 1 250 ° R

0.1 4000 cm^{-1}

.1630 cm^{-1} [illegible] 3440

100 [illegible] R [illegible] .TS [illegible] 100 **Potassium bromide** [illegible]
[illegible] KBr [illegible]

.(151 [illegible] 1963 [illegible] SRIP) KCl .**Potassium chloride R** [illegible]

[illegible] R [illegible] .**Potassium chloride IR** [illegible]
[illegible] 3 [illegible]
[illegible]) "Spectrophotometry in the infrared region [illegible]
[illegible] 1 [illegible] 250 [illegible] R [illegible] 45
[illegible] 0.1 [illegible] 670- 4000 cm^{-1}
.1630 cm^{-1} [illegible] 3440 [illegible]

[illegible] R [illegible] .TS [illegible] 350 **Potassium bromide** [illegible]
.KCl [illegible] 350 [illegible]

.(154 [illegible] 1963 [illegible] SRIP) $K_2Cr_2O_7$.**Potassium dichromate R** [illegible]

[illegible] R [illegible] .**Potassium dichromate R1** [illegible]
.$K_2Cr_2O_7$ [illegible] %99.9

.**Potassium dichromate TS** [illegible]

[illegible] 130 [illegible] 60 [illegible]
.[illegible] 1000.0 [illegible] VS [illegible] 0.005) [illegible] R1

[illegible] R [illegible] .VS [illegible] **0.0167** **Potassium dichromate** [illegible]
.[illegible] 1000 [illegible] $K_2Cr_2O_7$ [illegible] 4.904 [illegible]

[illegible] 1963 [illegible] SRIP) KH_2PO_4 .**Potassium dihydrogen phosphate R** [illegible]
.(155 [illegible]

.(156 [illegible] 1963 [illegible] SRIP) $K_3Fe(CN)_6$.**Potassium ferricyanide R** [illegible]

.**TS** [illegible] **10** **Potassium ferricyanide** [illegible]

[illegible] R [illegible] 1 [illegible]
.[illegible] 100 [illegible]

.[illegible] TS [illegible] 10) [illegible]

[illegible] 1963 [illegible] SRIP) $C_8H_5KO_4$.**Potassium hydrogen phthalate R** [illegible]

.(157

، **Potassium hydrogen phthalate standard TS** ӯⱬȨèǺⱬǤǖȿ ƙǅⱬșǿǼȽŢǟ ğɍǺⱬ ƁǿǺȽǶǭ ȯⱬŸŢ

ǿǟǼǬŋ Ž Ǘ°ӯ 120 ǦDZǿǼǖ Ž ǞǬǟȀè ǦǺǻDZţ ǕR ӯⱬȨèǺⱬǤǖȿ ƙǅⱬșǿǼȽŢǟ ğɍǺⱬ ȸŋ ȟ 10.21 āǟǾɫ .*ǒǟǞDZqǟ*

ŌŸǬⱬ ¢φǗ ʔŸʒ ȯⱬŸǂǟ ǟǾȽ pH ǒȽȽǟ ȣǺȽɫ .Ōŋ 1000 ʓǺǬφq R ȷⱬǟȦǖ ǼȽÊõǗ ƢǝǺǺ ȸŋ ƃǺʅǟ ǒǺţ ȸŋ ȣȣǺõ

.°ӯ 15 ǦDZǿǼǖ Ž 4.00 ǦŧȽŎǖ

ǦȞȦÔǖ Ǘ1963 ǗSRIP) $C_4H_5KO_4$ **.Potassium hydrogen tartarate R** ӯⱬȨèǺⱬǤǖȿ ƙǅⱬșǿǼȽŢǟ ğǟǺǜǺǜ

.(158

.Potassium hydrogen tartarate standard TS ӯⱬȨèǺⱬǤǖȿ ƙǅⱬșǿǼȽŢǟ ğǟǺǜǺǜ ƁǿǺȽǶǭ ȯⱬŸŢ

ǼȽÊõǗ ƢǝǺǺ ȸŋ ƃǺʅǟ ǒǺţ ȸŋ Ōŋ 100 ƃǗ R ӯⱬȨèǺⱬǤǖȿ ƙǅⱬșǿǼȽŢǟ ğǟǺǜǺǜ ȸŋ ȟ 2 ȣǺȒɫ .*ǒǟǞDZqǟ*

ǥǿǟǺǥ ƃǗ ŌÔǬǒ ȯⱬŸǂǟ ǥǿǟǺǥ õǺǬǩ .ⱫǺǶǟ ǦŸDZⱬΣǟ ʓǺɫȿ ǦȽDZǺDZǟ ǥǻǟǼè ğǟǽ ǦŸDZⱬǥ Ž ǥǟⱬǬȞţ R ȷⱬǟȦǖ

.decantation ǦφǺǟqǺǟ ȿǗ ǴȽÌǺǬǒǺǟ ţÂɫȿ ǗǼȩƘǒ ǼŸÔǬţǟ ǒÂƨǟ õǺǬɫ ǗǦⱬǺȣǒǟ

.ƘȒȞǬǖ ʓǟǺù TS ӯⱬȨèǺⱬǤǖȿ ƙǅⱬșǿǼȽŢǟ ğǟǺǜǺǜ ƁǿǺȽǶǭ ȯⱬŸŢ ȷⱬȮǺ ȷǗ Ǽƶ .*ǦŢǥŸŋ*

.(159 ǦȞȦÔǖ Ǘ1963 ǗSRIP) KOH **.Potassium hydroxide R** ӯⱬȨèǺⱬǤǖ ǼȽÊõșǿǼȽȽ

R ӯⱬȨèǺⱬǤǖ ǼȽÊõșǿǼȽȽ ȸŋ ȯⱬŸŢ **.TS ȯ ȟ 110~ Potassium hydroxide** ӯⱬȨèǺⱬǤǖ ǼȽÊõșǿǼȽȽ ȯⱬŸŢ

.(ȯ/ȯⱬŋ 2 āǿǺǾɫ Ǻŋ) KOH ȯ/ȟ 112 ǦǟǟǺǥ Ɓⱬʒ

،Potassium hydroxide/ethanol TS1 ȯⱬφǺʓǺqǟ ӯⱬȨèǺⱬǤǖ ǼȽÊõșǿǼȽȽ ȯⱬŸŢ

ȯⱬφǺʓǺqǟ ȯⱬŸŢ ȸŋ ȣȣǺõ ǿǟǼǬŋ ȣǺȒɫȿ ǒǺţ ȸŋ Ōŋ 20 Ž R ӯⱬȨèǺⱬǤǖ ǼȽÊõșǿǼȽȽ ȸŋ ȟ 40 āǟǾɫ .*ǒǟǞDZqǟ*

.ŽǺÔǖ ŌǝǺÊǖ ǼȮÊɫȿ ǗŌȽŸǖ ȯǟⱬù ǼõƘǒ õǺǬɫ .Ōŋ 1000 ʓǺǬφq TS (ȯ/ȟ 750~)

Ž ǞǼǟǾǭ ǕR ӯⱬȨèǺⱬǤǖ ǼȽÊõșǿǼȽȽ ،**VS ȯ ȯⱬŋ 1 Potassium hydroxide** ӯⱬȨèǺⱬǤǖ ǼȽÊõșǿǼȽȽ ȯⱬŸŢ

.Ōŋ 1000 Ž KOH ȸŋ ȟ 56.10 ʔŸʒ ƁⱬǬȞȽǒ ǒǺţǟ

ğɍǺⱬ ȸŋ ȟ 5 ǦǟǟǺǥ ⱫǺDZɫ :ǦȽǺǬǖ ǦŌǺǺǕǒǺǟ ȯ/ȯⱬŋ 1 ȯⱬŸȞŧŸǒ ȨȽȩǼǖ ǺȽõǺǬǖ ȸŋ ȨŌȞǬǖ ʅǬǺ .*ÈǼŌǬǖ ǦŌǺǺù*

ƙǅⱬșǿǼȽŢǟ ğɍǺⱬ ǨφǺõ ǟǽǗ .ǦȽùⱬǦȒŋ ȷàⱬǺȿ ğǺʒǺè 3 ǥǼŋ °ӯ 105 ǦDZǿǼǖ Ž R ӯⱬȨèǺⱬǤǖȿ ƙǅⱬșǿǼȽŢǟ

ƢǝǺǺ ȸŋ ƃǺʅǟ ǒǺţǟ ȸŋ Ōŋ 75 Ž āǟǾɫ .ⱫȽǺDZⱬǬǖ ŌǦȩ ȨȞȆȽɫ ȷǗ Ǽƶ ǗǥƘǦõ ğǿⱬǼǟ ŌǑÎǟ ӯⱬȨèǺⱬǤǖȿ

TS ȯⱬφǺʓǺqǟ/ƙǺǒǺⱬ ȯⱬǼǺǖ ȯⱬŸŢ ȯǺŧǶǬèǺǟ Ǘ ӯⱬȨèǺⱬǤǖ ǼȽÊõșǿǼȽȽ ȯⱬŸȞŧȇ ǺǺǶɫȿ R ȷⱬǟȦǖ ǼȽÊõǗ

1) ӯⱬȨèǺⱬǤǖ ǼȽÊõșǿǼȽȽ ȯⱬŸŢ ȸŋ Ōŋ 1 ùⱬǺȮɫ ӯⱬȨèǺⱬǤǖȿ ƙǅⱬșǿǼȽŢǟ ğɍǺⱬ ȸŋ ȟ 0.2042 Ōõ .ǺǶÎŧõ

.ǺǩǟⱬǬŋ ŌǑÎǟ ӯⱬȨèǺⱬǤǖ ǼȽÊõșǿǼȽŢ ǦǺǿǺȽǶţǟ ŌȽǺǂǟ ÈȽŎǨ ǻǺǶɫ ȷǗ Ǽƶ .VS (ȯ/ȯⱬŋ

ȷǞǺɫ ȷǗ Ǽƶ ŌǒǾǒ .ǒǟⱬŢŸǒ ȏǺǶɫ ǺŋǼʒ ȷⱬǟȦǖ ǼȽÊõǗ ƢǝǺǺ ǦǺⱬŸǖ ğǟǼȽÊõșǿǼȽŢǟ ŌȽǺŢ ǑǬǬ .*ȸǺǺǺǬǖ*

.soda lime R ǟǻǻƔǉǟ Ƙƛ ǒǻǛư ǟ ǻǤǾǟǿ ǥǻşǨȟ ǕǦȶǕǶȟ ǕǦǤèǨȠ ǤǭǯǨǯǟ Ƙǭ ğǟǻǻǽè ğǟǽ ǨǾǻǟǯ Ž

Ž ǻǟǿǿȟ ǕR ÿǻǯèǨǩǻǤǟ ǽǯÊõşǿǽǯȽ ،VS ȯ ȯǻȠ **0.5 Potassium hydroxide** ÿǻǯèǨǩǻǤǟ ǽǯÊõşǿǽǯȽ ȯǻǛȚ

.Ǒȡ 1000 Ž KOH ȸȡ ȟ 28.05 ɁǛȝ ɃǻǬǶǯǒ ǒǨȶǟ

ȷǟǻǨȝ ƘƠ ǤǻǻǒǻȶǟǤǕǨǕǟ ȶǨǤǨǟ ȯǻǛǶȶǛǒ ȨǯȩǽǟǨǯõǨǬǟ ȸȡ ȨǑǶǬǟ ȴǬǨ *.standardization ÈǯǑǬǟ ǤǑǨü*

.VS (ȯ/ȯǻȠ 1) ÿǻǯèǨǩǻǤǟ ǽǯÊõşǿǽǯȽ

Ž ǻǟǿǿȟ ǕR ÿǻǯèǨǩǻǤǟ ǽǯÊõşǿǽǯȽ ،VS ȯ ȯǻȠ **0.1 Potassium hydroxide** ÿǻǯèǨǩǻǤǟ ǽǯÊõşǿǽǯȽ ȯǻǛȚ

.Ǒȡ 1000 Ž KOH ȸȡ ȟ 5.610 ɁǛȝ ɃǻǬǶǯǒ ǒǨȶǟ

ȷǟǻǨȝ ƘƠ ǤǻǻǒǻȶǟǤǕǨǕǟ ȶǨǤǨǟ ȯǻǛǶȶǛǒ ȨǯȩǽǟǨǯõǨǬǟ ȸȡ ȨǑǶǬǟ ȴǬǨ *.standardization ÈǯǑǬǟ ǤǑǨü*

.VS (ȯ/ȯǻȠ 1) ÿǻǯèǨǩǻǤǟ ǽǯÊõşǿǽǯȽ

ǽǯÊõşǿǽǯȽ ،VS ȯ ȯǻȠ **0.5 Potassium hydroxide/ethanol** ȯǻǾǨǯǨqǟ ÿǻǯèǨǩǻǤǟ ǽǯÊõşǿǽǯȽ ȯǻǛȚ

.Ǒȡ 1000 Ž KOH ȸȡ ȟ 28.05 ɁǛȝ ɃǻǬǶǯǒ TS (ȯ/ȟ 710~) ȯǻǾǨǯǨqǟ ȯǻǛȚ Ž ǻǟǿǿȟ ǕR ÿǻǯèǨǩǻǤǟ

ȤǻǨǺȴ :ǤǯǒǨǬǟ ǤǑǨǕǒǨǟ ȯ/ȯǻȠ 0.5 ȯǻǛǶȶǛǒ ȨǯȩǽǟǨǯõǨǬǟ ȸȡ ȨǑǶǬǟ ȴǬǨ *.standardization ÈǯǑǬǟ ǤǑǨü*

ǽǯÊõşǿǽǯȽ ȯǻǛǶȶê ǨǨǨǶş ǒǨȶǟ ȸȡ Ǒȡ 50 ǿǟǽǑȠ VS (ȯ/ȯǻȠ 0.5) ǑǨǿǻǛõşǿǽǯǓǟ Ȑ þ ȯǻǛȚ ȸȡ Ǒȡ 25.0

.ǨǶÎȶõ TS ȯǻǾǨǯǨqǟ/ƙǨǒǨǯǻ ȯǻǽǨǒǟ ȯǻǛȚ ȯǨȶǬèǨǟ ǕVS (ȯ/ȯǻȠ 1) ȯǻǾǨǯǨqǟ/ÿǻǯèǨǩǻǤǟ

ǽǯÊõşǿǽǯȽ ،VS ȯ ȯǻȠ **0.02 Potassium hydroxide/ethanol** ȯǻǾǨǯǨqǟ ÿǻǯèǨǩǻǤǟ ǽǯÊõşǿǽǯȽ ȯǻǛȚ

.Ǒȡ 1000 Ž KOH ȸȡ ȟ 1.122 ɁǛȝ ɃǻǬǶǯǒ TS (ȯ/ȟ 710~) ȯǻǾǨǯǨqǟ ȯǻǛȚ Ž ǻǟǿǿȟ ǕR ÿǻǯèǨǩǻǤǟ

ȷǟǻǨȝ ƘƠ ǤǻǻǒǻȶǟǤǕǨǕǟ ȶǨǤǨǟ ȯǻǛǶȶǛǒ ȨǯȩǽǟǨǯõǨǬǟ ȸȡ ȨǑǶǬǟ ȴǬǨ *.standardization ÈǯǑǬǟ ǤǑǨü*

.VS (ȯ/ȯǻȠ 0.5) ȯǻǾǨǯǨqǟ/ÿǻǯèǨǩǻǤǟ ǽǯÊõşǿǽǯȽ ȯǻǛȚ

.(161 ǦǶǨǑǟ Ǖ1963 ǕSRIP) KI **.Potassium iodide R** ÿǻǯèǨǩǻǤǟ ǽǨǻǻǨ

ȸȡ ȟ 10 ǟǟǿȴ :ƃǨǬǟ ǿǨǬǶȑɍǟ ɄǿǤǛȴ ɃǿǬǟ R ÿǻǯèǨǩǻǤǟ ǽǨǻǻǨ **.Potassium iodide AsR** ÿǻǯèǨǩǻǤǟ ǽǨǻǻǨ

ǥǨǕȩ 2 ȢǨȒȴ ǕǒǨȶǟ ȸȡ Ǒȡ 35ş AsTS (ȯ/ȟ 250~) ǑǨǿǻǛõşǿǽǯǓǟ Ȑ þ ȸȡ Ǒȡ 25 Ž R ÿǻǯèǨǩǻǤǟ ǽǨǻǻǨ

ǦǺǕǿ ǰǬǨ ɍ ǕǑǯǽǯèǿɉǟ ǑǮɉ ÿǨǶǬǟ ǿǨǬǶȑɍǟ ȨǤǕȴş stannous chloride AsTS ɃǨǨǽǑǑǟ ǽǨǿǻǛõ ȯǻǛȚ ȸȡ

.ǤǯəǨȠ

83 ǤǟǟǨǿ ɁǛȝ ɃǻǬȝ R ÿǻǯèǨǩǻǤǟ ǽǨǻǻǯǒ ȯǻǛȚ **.TS ȯ ȟ 80 Potassium iodide** ÿǻǯèǨǩǻǤǟ ǽǨǻǻǨ ȯǻǛȚ

.(ȯ/ȯǻȠ 0.5 ǟǿǨǑȴ Ǩȡ) KI ȸȡ ȯ/ȟ

.(162 ǦǶǨǑǟ Ǖ1963 ǕSRIP) KNO_3 **.Potassium nitrate R** ÿǻǯèǨǩǻǤǟ ğǟǨǬǿ

،KNO_2 **.Potassium nitrite R** ÿǻǯèǨǩǻǤǟ ƘǨǨǬǿ

[illegible].

[illegible] 0.35 [illegible] .TS ([illegible] 750~) [illegible].

Potassium nitrite [illegible] **100** [illegible] .**TS** [illegible] R [illegible] **100** [illegible] KNO_2 [illegible].

Potassium permanganate R [illegible] $KMnO_4$ (SRIP 1963 [illegible] 165).

Potassium permanganate [illegible] **10** [illegible] .**TS** [illegible] R [illegible] 10 [illegible] $KMnO_4$ [illegible].

Potassium permanganate [illegible] **0.02** [illegible] .**VS** [illegible] R [illegible] 3.161 [illegible] $KMnO_4$ [illegible] 1000 [illegible].

standardization [illegible] 0.02 [illegible] 0.2 [illegible] 110 [illegible] TS ([illegible] 1760~) [illegible] 7 [illegible] 250 [illegible] 70 [illegible] 15 [illegible] 60 [illegible] 6.7 [illegible] 1 [illegible] (0.02 [illegible]) VS. [illegible].

[illegible].

Potassium sulfate R [illegible] K_2SO_4 (SRIP 1963 [illegible] 165).

Potassium sulfate [illegible] **174** [illegible] **TS**،

[illegible] 174 [illegible] R [illegible] 1000 [illegible].

Potassium tetraoxalate R [illegible] $C_4H_3KO_8,2H_2O$ (SRIP 1963 [illegible] 166).

Potassium tetraoxalate standard TS [illegible].

[illegible] 25.42 [illegible] R [illegible] R [illegible] 1000 [illegible].

Pyridine R [illegible] C_5H_5N (SRIP 1963 [illegible] 169).

Pyridine, anhydrous, R [illegible] R [illegible] R.

Red stock standard TS [illegible]،

[illegible] 0.1 [illegible] *standardization* [illegible]

[illegible] 100 [illegible] 40.0 [illegible] (~70 [illegible]) [illegible] 5 [illegible] 110 [illegible] TS (~000 [illegible]) [illegible]

Soda lime R [illegible] (SRIP 1963 [illegible] 174).

Sodium acetate R [illegible] $C_2H_3NaO_2,3H_2O$ (SRIP 1963 [illegible] 176).

Sodium acetate 150 [illegible] **TS** [illegible] R [illegible] 150 [illegible] $C_2H_3NaO_2$.

Sodium alizarinsulfonate R [illegible] 3,4-dihydroxy-9,10-anthraquinone-2-sulfonic acid [illegible] $C_{14}H_7NaO_7S,H_2O$.

[illegible] TS (~750 [illegible]).

Sodium alizarinsulfonate 1 [illegible] **TS** [illegible] 0.11 [illegible] R [illegible] 100 [illegible].

Sodium hydrogen carbonate R [illegible] $NaHCO_3$ (SRIP 1963 [illegible] 177).

Sodium carbonate R [illegible] $Na_2CO_3, 10H_2O$ (SRIP 1963 [illegible] 179).

Sodium carbonate, anhydrous R [illegible] Na_2CO_3 (SRIP 1963 [illegible] 179).

Sodium carbonate 50 [illegible] **TS** [illegible] R [illegible] 50 [illegible] Na_2CO_3 (0.5 [illegible]).

Sodium carbonate standard TS [illegible] 2.64 [illegible] R [illegible] 2.093 [illegible] R [illegible] 1000 [illegible].

Sodium chloride R [illegible] NaCl (SRIP 1963 [illegible] 181).

Sodium citrate R [illegible] $C_6H_5Na_3O_7,2H_2O$.

.[illegible] $C_6H_5Na_3O_7$ [illegible] %99.0 [illegible]

.[illegible]

.TS ([illegible] 750~) [illegible]

.[illegible] 100 [illegible] .*appearance of solution* [illegible]

[illegible] 15 [illegible] R [illegible] .*water* [illegible]

.[illegible] 130 [illegible] 110 [illegible]

[illegible] 20 [illegible] 0.15 [illegible]

Non-aqueous [illegible] VS ([illegible] 0.1) [illegible]

[illegible] VS ([illegible] 0.1) [illegible] 1 [illegible] .(127 [illegible]) A [illegible] Titration

.$C_6H_5Na_3O_7$ [illegible] 8.603

.(182 [illegible] 1963 SRIP) $Na_3Co(NO_2)_6$ **.Sodium cobaltinitrite R** [illegible]

R [illegible] **.TS** [illegible] **100 Sodium cobaltinitrite** [illegible]

.$Na_3Co(NO_2)_6$ [illegible] 100 [illegible]

.(183 [illegible] 1963 SRIP) NaF **.Sodium fluoride R** [illegible]

.(185 [illegible] 1963 SRIP) NaOH **.Sodium hydroxide R** [illegible]

[illegible] R [illegible] **.TS** [illegible] **400~ Sodium hydroxide** [illegible]

.NaOH [illegible] 400 [illegible]

[illegible] R [illegible] **.TS** [illegible] **300~ Sodium hydroxide** [illegible]

.NaOH [illegible] 300 [illegible]

[illegible] R [illegible] **.TS** [illegible] **200~ Sodium hydroxide** [illegible]

.NaOH [illegible] 200 [illegible]

[illegible] R [illegible] **.TS** [illegible] **80~ Sodium hydroxide** [illegible]

.([illegible] 2 [illegible]) NaOH [illegible] 80 [illegible]

[illegible] R [illegible] **.VS** [illegible] **1 Sodium hydroxide** [illegible]

.[illegible] 1000 [illegible] NaOH [illegible] 40.01 [illegible]

[illegible] 1 [illegible] .*standardization* [illegible]

[illegible] 3 [illegible] 105 [illegible] R [illegible] 5 [illegible]

ȸȘ Ōȹ 75 Ž ā ăǾƚ .ƵǂǍǷǪǖǟ ŌǦȩ ĘǶÊǐ ȷǕ ǼǷǂƶ ÛǥƘǤõ ğ ăǿƶǕǣ ŌȮȉ ɁǕȝ ÿƶǂÊǍǨƶǦǖǟȘ ƙǷȘǿǼǂǨǟ ğ ɼǍǰƶ
ȯƶǼǍǖǟ ȯƶǕȚ ȯǍȶǨǪèǍǣ Ûÿƶǂáƶ Ôǖǟ ǼǂÊõȘǿǼǂȽ ȯƶǕǶȶê ǍǍǨǩȘ R ȷƶǣǍȮǖǟ ǼǂÊõǕ ƱǝǍǍǬ ȸȘ ƃǍȴ ǎ ŏǍţǟ
ȯƶǕȚ ȸȘ Ōȹ 1 ȕƶǍȮǨ ÿƶǂÊǍǨƶǦǖǟȘ ƙǷȘǿǼǂǨǟ ğ ɼǍǰƶ ȸȘ ȟ 0.2042 Ōõ .ǍǨ Î ȶõ TS ȯƶǍǰǫǟ/ƙǍǓǍǰƶ
.ǿǍȮǪȹ ŌȮ Î ǣ ÿƶǂáƶ Ôǖǟ ǼǂÊõȘǿǼǂȽ ŌǂǍȚ ÈǂǂǓǨ áǍǨǩ ȷǕ Ƽƶ .VS (ȯ/ȯƶȹ 1) ÿƶǂáƶ Ôǖǟ ǼǂÊõȘǿǼǂȽ
ȷÂǍǐ ȷǕ Ƽƶ ŌǒǾǒ .ǒǟƶǢǓ ô ǍǨǩ ǍȹǼǍȝ ȷƶǣǍȮǖǟ ǼǂÊõǕ ƱǝǍǍǬ ǦǍƶǓǖǟ ğ ăǼǂÊõȘǿǼǂǨǟ ŌǂǍȚ ÒǪǬ *.ȸǍÁǪǟ*
.R ăáƶ Ôǖǟ Ƙƛ ǒƶǕơ ā ƶǦǕǣ ǥáȘÂȹ ÛǩǼǂǷ ĘǕ8ǨǕ ÛǦǦèǍǍȹ ǦǂǷǍǷǟ Ƙȡ ğ ăáăǼè ğ ăǣ ǍǿǟƶȩŽ
ŏǍţǟ Ž ǍǟǾȹ ÛR ÿƶǂáƶ Ôǖǟ ǼǂÊõȘǿǼǂȽ **.VS** ȯ ȯƶȹ **0.2** **Sodium hydroxide** ÿƶǂáƶ Ôǖǟ ǼǂÊõȘǿǼǂȽ ȯƶǕȚ
.Ōȹ 1000 Ž NaOH ȸȘ ȟ 8.001 ɃƶǶǂǒ
ȷǟƶǍȝ ǨƠ Ǧƶƶòƶţǟ ǦŌǍǍÛǖǟ ţǍǦǨǍǣ ȯƶǕǶȶǕǒ ĘǂȩǼǖǟ ÂǂõǍǪǖǟ ȸȘ ĘŌǶǪǖǟ ɭǪǍ *.standardization* ***ÈǂǂŌǪǟ ǦŌǍǍü***
.VS (ȯ/ȯƶȹ 1) ÿƶǂáƶ Ôǖǟ ǼǂÊõȘǿǼǂȽ ȯƶǕȚ
ŏǍţǟ Ž ǍǟǾȹ ÛR ÿƶǂáƶ Ôǖǟ ǼǂÊõȘǿǼǂȽ **.VS** ȯ ȯƶȹ **0.1** **Sodium hydroxide** ÿƶǂáƶ Ôǖǟ ǼǂÊõȘǿǼǂȽ ȯƶǕȚ
.Ōȹ 1000 Ž NaOH ȸȘ ȟ 4.001 ɃƶǶǂǒ
ȷǟƶǍȝ ǨƠ Ǧƶƶòƶţǟ ǦŌǍǍÛǖǟ ţǍǦǨǍǣ ȯƶǕǶȶǕǒ ĘǂȩǼǖǟ ÂǂõǍǪǖǟ ȸȘ ĘŌǶǪǖǟ ɭǪǍ *.standardization* ***ÈǂǂŌǪǟ ǦŌǍǍü***
.VS (ȯ/ȯƶȹ 1) ÿƶǂáƶ Ôǖǟ ǼǂÊõȘǿǼǂȽ ȯƶǕȚ
ŏǍţǟ Ž ǍǟǾȹ ÛR ÿƶǂáƶ Ôǖǟ ǼǂÊõȘǿǼǂȽ **.Sodium hydroxide VS** ȯ ȯƶȹ **0.05** ÿƶǂáƶ Ôǖǟ ǼǂÊõȘǿǼǂȽ ȯƶǕȚ
.Ōȹ 1000 Ž NaOH ȸȘ ȟ 2.000 ɃƶǶǂǒ
ȷǟƶǍȝ ǨƠ Ǧƶƶòƶţǟ ǦŌǍǍÛǖǟ ţǍǦǨǍǣ ȯƶǕǶȶǕǒ ĘǂȩǼǖǟ ÂǂõǍǪǖǟ ȸȘ ĘŌǶǪǖǟ ɭǪǍ *.standardization* ***ÈǂǂŌǪǟ ǦŌǍǍü***
.VS (ȯ/ȯƶȹ 1) ÿƶǂáƶ Ôǖǟ ǼǂÊõȘǿǼǂȽ ȯƶǕȚ
ŏǍţǟ Ž ǍǟǾȹ ÛR ÿƶǂáƶ Ôǖǟ ǼǂÊõȘǿǼǂȽ **.Sodium hydroxide VS** ȯ ȯƶȹ **0.01** ÿƶǂáƶ Ôǖǟ ǼǂÊõȘǿǼǂȽ ȯƶǕȚ
.Ōȹ 1000 Ž NaOH ȸȘ ȟ 0.4001 ɃƶǶǂǒ
ȷǟƶǍȝ ǨƠ Ǧƶƶòƶţǟ ǦŌǍǍÛǖǟ ţǍǦǨǍǣ ȯƶǕǶȶǕǒ ĘǂȩǼǖǟ ÂǂõǍǪǖǟ ȸȘ ĘŌǶǪǖǟ ɭǪǍ *.standardization* ***ÈǂǂŌǪǟ ǦŌǍǍü***
.VS (ȯ/ȯƶȹ 1) ÿƶǂáƶ Ôǖǟ ǼǂÊõȘǿǼǂȽ ȯƶǕȚ
Sodium hydroxide, carbonate-free, ğ ǍǫƶǣǍǬǖǟ ȸȘ ƃǍȴ ǎ Û**VS** ȯ ȯƶȹ **1** ÿƶǂáƶ Ôǖǟ ǼǂÊõȘǿǼǂȽ ȯƶǕȚ
.Ōȹ 1000 Ž NaOH ȸȘ ȟ 40.01 ɃƶǶǂǒ ŏǍţǟ Ž ǍǟǾȹ ÛR ÿƶǂáƶ Ôǖǟ ǼǂÊõȘǿǼǂȽ **.VS**
Ʊǹƶǩ ȝȹ .ǼõƘǒ õǍǪȘ ȯ/ȟ 600 - 400 ÂǂõǍǪǣ ȯƶǕȚ ȤǍǪǫ ŏǍţǟ Ž ÛR ÿƶǂáƶ Ôǖǟ ǼǂÊõȘǿǼǂȽ ā ăǾƚ *.ǒǟǍǷǬǫǟ*
ȹǍǹ ǒǍȹ ǼǕǕǪȹ ƶȽ Ǎȶõ ƵǍǍȘ ŽǍÔǖǟ ŽǍÛǖǟ ŌǝǍÊǖǟ ǼǶÊǐ ÛȷƶǣǍȮǖǟ ǼǂÊõǕ ƱǝǍǍǬ î ǍÔǪȹǟ ǼǍǷǪǒ ǿǾƩǟ
.R ȷƶǣǍȮǖǟ ǼǂÊõǕ ƱǝǍǍǬ ȸȘ

VS (1 ...) ... 45 ... *test for carbonates* ...

... TS ...

... 20 ...

... 0.1 ...

... *standardization* ...

... 3 ... 105 ... R ... 5 ...

... 75 ...

... R ...

... 1 ... 0.2042 ... TS ...

... VS (1 ...) ...

... R ...

Sodium hydroxide, carbonate-free, ... VS ... **0.5** ...

... 1000 ... NaOH ... 20.00 ... R ... **VS**

... 1) ...

VS (...).

Sodium hydroxide, carbonate-free, ... VS ... **0.2** ...

... 1000 ... NaOH ... 8.00 ... R ... **VS**

... 1) ...

VS (...).

Sodium hydroxide, carbonate- ... VS ... **0.1** ...

... 1000 ... NaOH ... 4.001 ... R ... **free, VS**

...

1) .VS

Sodium hydroxide, carbonate-free, VS 0.2

1000 NaOH 0.8001 R **.VS**

1) .VS

Sodium hydroxide, carbonate-free, VS 0.1

1000 NaOH 0.4001 R **.VS**

1) .VS

(Sodium thioglycolate R) **Sodium mercaptoacetate R**

$C_2H_3NaO_2S$.

TS (750~)

(189 1963 SRIP) $NaNO_2$ **.Sodium nitrite R**

$NaNO_2$ 10 R **.Sodium nitrite TS**

6.900 R **.VS 0.1 Sodium nitrite**

1000 $NaNO_2$.

0.1 *standardization*

300 VS (0.02) 50.0

TS (100~) 20.0 25

R 2 10

TS VS (0.1)

(190 1963 SRIP) $C_2Na_2O_4$ **.Sodium oxalate R**

(195 1963 SRIP) Na_2SO_4 **.Sodium sulfate, anhydrous, R**

[illegible] **Sodium sulfide R.** $Na_2S,9H_2O$ ([illegible] SRIP [illegible] 1963 [illegible] 195).

[illegible] **Sodium sulfide TS.**

[illegible]. [illegible] 12 [illegible] R [illegible] 25 [illegible] R [illegible] 100 [illegible].

[illegible] **Sodium tetraborate R.** [illegible] $Na_2B_4O_7, 10H_2O$.

[illegible]. [illegible].

[illegible]. [illegible] 20 [illegible] 0.6 [illegible] (~750 [illegible]) TS.

[illegible] 0.01 [illegible] pH Value of a 0.01 mol/l solution. [illegible] 0.3814 [illegible] 100 [illegible] 6.5-7.4 [illegible] 9.15-9.20 [illegible] 25 °[illegible].

[illegible] Chlorides. [illegible] 1.0 [illegible] 20 [illegible] 1 [illegible] (~1000 [illegible]) TS [illegible] "Limit test for chlorides" ([illegible] 112) [illegible] 250 [illegible].

[illegible] Sulfates. [illegible] 0.5 [illegible] 20 [illegible] 2 [illegible] (~70 [illegible]) TS [illegible] "Limit test for sulfates" ([illegible] 113) [illegible] 1.0 [illegible].

[illegible] **Sodium tetraborate standard TS.**

[illegible]. [illegible] 3.81 [illegible] R [illegible] R [illegible] 1000 [illegible].

[illegible]. [illegible].

[illegible] **Sodium tetraphenylborate R.** $C_{24}H_{20}BNa$.

[illegible]. [illegible] R [illegible].

[illegible]. [illegible] R [illegible] light petroleum R.

[illegible]. [illegible] 20 [illegible] 7.5 [illegible].

[illegible] **Sodium tetraphenylborate 30** [illegible] **TS.** [illegible]

$C_{24}H_{20}BNa$ [illegible] 30 [illegible] R [illegible].

[illegible] R [illegible] 1 [illegible] 5 [illegible].

[illegible].

R [illegible] Sodium thioglycolate R [illegible].

(197 [illegible] 1963 SRIP) $Na_2S_2O_3,5H_2O$ **Sodium thiosulfate R** [illegible]

[illegible] R [illegible] VS [illegible] **0.1 Sodium thiosulfate** [illegible]

[illegible] 1000 [illegible] $Na_2S_2O_3$ [illegible] 15.82 [illegible].

[illegible] 0.1 [illegible] *standardization* [illegible]

[illegible] VS [illegible] 0.0167) [illegible] 30.0

TS [illegible] 250~) [illegible] 5 R [illegible] 2 [illegible] 50

[illegible] 100 [illegible] 10 [illegible]

[illegible] TS [illegible].

[illegible] R [illegible] VS [illegible] **0.05 Sodium thiosulfate** [illegible]

[illegible] 1000 [illegible] $Na_2S_2O_3$ [illegible] 7.910 [illegible].

[illegible] *standardization* [illegible]

VS [illegible] 0.1) [illegible].

[illegible] R [illegible] VS [illegible] **0.01 Sodium thiosulfate** [illegible]

[illegible] 1000 [illegible] $Na_2S_2O_3$ [illegible] 1.582 [illegible].

[illegible] *standardization* [illegible]

VS [illegible] 0.1) [illegible].

(198 [illegible] 1963 SRIP) $SnCl_2, 2H_2O$ **Stannous chloride R** [illegible]

Stannous chloride TS [illegible]

TS [illegible] 250~) [illegible] 100 R [illegible] 330 [illegible]

[illegible] 1000 [illegible].

Stannous chloride AsTS [illegible]

250~) [illegible] TS [illegible]

fine-grained [illegible] TS [illegible].

10 6 10 *test for arsenic*

50 16 AsTS (250~)

1

(199 1963 SRIP) R R **Starch R**

(99 1963 SRIP) **Starch, soluble, R**

Starch TS

5 R R 0.5

100

TS

1963 SRIP) starch-iodide paper R **Starch/iodide paper R**

(200

$C_7H_6O_6S,2H_2O$ **Sulfosalicylic acid R**

TS (750~)

50 5.0

105 °

1

1.0

1.0 1.0 *sulfated ash*

1 TS (1760~)

1.0

175 R **Sulfosalicylic acid TS**

$C_7H_6O_6S$

(202 1963 SRIP) SO_2 **Sulfur dioxide R**

1963 SRIP) R TS **1760~ Sulfuric acid**

d~1.84 (202

Sulfuric acid, nitrogen-free TS **1760~**

ȮDZɉ ǿȦǪṅɟā ɄøǤŸ\ş H_2SO_4 ȸņ ȯ/ȟ 1760 ȸɜ ȮȫȦ ɍ Ȧņ ʔŸɜ ɃşȦΣā TS (ȯ/ȟ 1760~) ȬȦǿźȦŸÊöā
.ğāȀǪŀöā

ɉźȮȦ ÜR ȸȦÆȦÂȦǣ ȮȄÆź ɄəȦȦǷ ȸņ ŋŸņ 8 ȣȦȒɫş ÛåȀȸȽ ÛöȦƫā ȸņ Ȯņ 5 ǿāÆȫņ Ȯņ 45 ǯÂɫɫ .*Nitrates ğāȀǪŀöā*
.ȁÆDZ ÆġȦÎöā ȧǿàɉā ȸɜ ÆȦÂȦ ɍ ɉźŸǣ şÜ ɉźŸöā ČÆɜ ȯźŸǂā

.TS ȯ ȟ **190~ Sulfuric acid** ȬȦǿźȦŸÊöā ȐƥȯźŸȚ

Ƀźʒ .åƎɫş ÛöȦƫā ȸņ ȳźDzġ 9 ʒņ TS (ȯ/ȟ 1760~) ȬȦǿźȦŸÊöā ȐƥȯźŸȚ ȸņ ȀɫDzġ 1 ǯÂɛ .*öāȀDZqā*
..*d*~1.12 ÜH_2SO_4 ȸņ ȯ/ȟ 190 ǦǣāȀɇ ǰǨȦȦöā ȯźŸǂā

.TS ȯ ȟ **100~ Sulfuric acid** ȬȦǿźȦŸÊöā ȐƥȯźŸȚ

1000 ǯȦǪɋɋ ŏȦƫā ȸņ ȣȣȦȭ ǿāÆȫņ ɃÜ TS (ȯ/ȟ 1760~) ȬȦǿźȦŸÊöā ȐƥȯźŸȚ ȸņ Ȯņ 57 ȣȦȒɫ .*öāȀDZqā*
.*d*~1.065 Ü(ȯ/ȯźņ 1 ā ǿȦȮɫ Ȧņ) Ȯņ

.TS ȯ ȟ **10~ Sulfuric acid** ȬȦǿźȦŸÊöā ȐƥȯźŸȚ

.Ȯņ 1000 ǯȦǪɋɋ ŏȦƫā ȸņ ȣȣȦȭ ǿāÆȫņ TS (ȯ/ȟ 100~) ȬȦǿźȦŸÊöā ȐƥȯźŸȚ ȸņ Ȯņ 100 ǯÂɫɫ .*öāȀDZqā*

ȤȦȦɫ ÛTS (ȯ/ȟ 1760~) ȬȦǿźȦŸÊöā ȐƥȯźŸȚ .**VS** ȯ ȯźņ **0.5 Sulfuric acid** ȬȦǿźȦŸÊöā ȐƥȯźŸȚ
.Ȯņ 1000 Ž H_2SO_4 ȸņ ȟ 49.04 ɃźɄȄö ŏȦƫȦǣ

āāǾɫ :ǦȄöȦǪöā ǦȫȦȀÛöȦǣ ȯ/ȯźņ 0.5 ȯźŸɄɫŸö ȨȄȩÆöā ÂȄȭȀǪöā ȸņ ȨȫɄǪöā ɭǪȦ .*standardization* *ȀȄȫǪöā ǦȫȦȀü*
1 ġÆņ °ÿ 270 ǦDZǿÆöā Ž ȀȫāȦè ǦȦȦDzɦ ÛR ǦȄəȦņȸŸöā ȳźȦåźÔöā ğȦɋźǣȦǷ ȸņ ÛǦȄüźǤȒņ ɉşàźņ Ûȟ 1.5 ǦǣāȀɇ
TS ȯźɋȦǯȦqā/ȮȄǯȄƫā ǦȄöȦȮǨȦǣ ȯźŸȚ ȯȦɫȞǪèȦǣ ÛȬȦǿźȦŸÊöā ȐƥȯźŸɄɫê ȀȦȞɫş ŏȦƫā ȸņ Ȯņ 50 Ž ÛǦɜȦè
0.5) ȬȦǿźȦŸÊöā ȐƥȯźŸȚ ȸņ Ȯņ 1 ȕźȦȮǨ ǦȄəȦņȸŸöā ȳźȦåźÔöā ğȦɋźǣȦǷ ȸņ ŋŸņ 52.99 Ȯȭ .ȀȞÎɫȭ
.VS (ȯ/ȯźņ

ÛTS (ȯ/ȟ 1760~) ȬȦǿźȦŸÊöā ȐƥȯźŸȚ .Û**VS** ȯ ȯźņ **0.05** Û**Sulfuric acid** ȬȦǿźȦŸÊöā ȐƥȯźŸȚ
.Ȯņ 1000 Ž H_2SO_4 ȸņ ȟ 4.904 ɃźɄȄö ŏȦƫȦǣ ȤȦȦɫ

ɉāźȦɜ ǨƠ Ǧźźòźƫā ǦȫȦȀÛöā ƫȦǦǨȦǣ ȯźŸɄɫŸö ȨȄȩÆöā ÂȄȭȀǪöā ȸņ ȨȫɄǪöā ɭǪȦ .*standardization* *ȀȄȫǪöā ǦȫȦȀü*
.VS (ȯ/ȯźņ 0.5) ȬȦǿźȦŸÊöā ȐƥȯźŸȚ

ÛTS (ȯ/ȟ 1760~) ȬȦǿźȦŸÊöā ȐƥȯźŸȚ .Û**VS** ȯ ȯźņ **0.01 Sulfuric acid** ȬȦǿźȦŸÊöā ȐƥȯźŸȚ
.Ȯņ 1000 Ž H_2SO_4 ȸņ ȟ 0.9808 ɃźɄȄö ŏȦƫȦǣ ȤȦȦɫ

ɉāźȦɜ ǨƠ Ǧźźòźƫā ǦȫȦȀÛöā ƫȦǦǨȦǣ ȯźŸɄɫŸö ȨȄȩÆöā ÂȄȭȀǪöā ȸņ ȨȫɄǪöā ɭǪȦ .*standardization* *ȀȄȫǪöā ǦȫȦȀü*
.VS (ȯ/ȯźņ 0.5) ȬȦǿźȦŸÊöā ȐƥȯźŸȚ

[illegible] TS ([illegible] 1760~) [illegible] **0.005 Sulfuric acid** [illegible] VS [illegible]

[illegible] 1000 [illegible] H_2SO_4 [illegible] 0.4904 [illegible]

[illegible] *standardization* [illegible]

VS ([illegible] 0.5) [illegible]

[illegible] $C_{18}H_{14}$ [illegible] 1,4-Diphenylbenzene **p-Terphenyl R** [illegible]

Mercaptoacetic acid R [illegible] Thioglycolic acid R [illegible]

2,7-Disodium 4-[(O-arsonophenyl)azo]-3-hydroxy-2,7-naphthalenedisulfonate, **Thorin R** [illegible]

$C_{16}H_{11}AsN_2Na_2O_{10}S_2$

TS [illegible] **2 Thorin** [illegible]

[illegible] 100 [illegible] R [illegible] 0.2 [illegible]

[illegible]

[illegible] 1 [illegible]

$Th(NO_3)_4,4H_2O$ **Thorium nitrate R** [illegible]

[illegible]

TS ([illegible] 750~) [illegible]

2.401 [illegible] R [illegible] **0.005 Thorium nitrate** [illegible] VS [illegible]

[illegible] 1000 [illegible] $Th(NO_3)_4$ [illegible]

[illegible] 0.005 [illegible] *standardization* [illegible]

[illegible] R [illegible] 0.050

([illegible] 1) [illegible] 0.6 [illegible] 20.0 [illegible] 250 [illegible]

[illegible] VS ([illegible] 0.1) [illegible] TS

[illegible] TS [illegible] 3.0 [illegible] 5 [illegible]

[illegible] 1 [illegible] 0.8398 [illegible]

VS ([illegible] 0.005) thorium nitrate [illegible]

(207 [illegible] 1963 [illegible] SRIP) $C_{28}H_{30}O_4$ **Thymolphthalein R** [illegible]

Thymolphthalein/ethanol TS [illegible]

[illegible] TS ([illegible] 750~) [illegible] 100 [illegible] R [illegible] 0.1 [illegible]

(209 SRIP 1963) C_7H_8 **Toluene R**

(213 SRIP 1963) $C_4H_6O_6U,2H_2O$ **Uranyl acetate R**

Uranyl/zinc acetate TS

50 5

30 TS (300~) 30

TS (300~)

Water, carbon-dioxide-free, R

Xylenol orange R

[3*H*-2,1-Benzoxathiol-3-ylidene bis [(6-hydroxy-5-methyl-*m*-phenylene) ,methylenenitrilo]] tetraacetic acid, *S*,*S*-dioxide, $C_{31}H_{32}N_2O_{13}S$.

TS (750~)

Xylenol orange indicator mixture R

R 10 R 0.1

(215 SRIP 1963) **Yeast extract, water-soluble, R**

Yellow stock standard TS

10.7 TS 1.9 TS 9.5

100.0 TS 4.0 TS

TS (10~)

(216 SRIP 1963) Zn **Zinc R**

Zinc AsR, granulated R

limit of arsenic 10

stannated hydrochloric acid AsTS (250~) 50

R 10 1

ȯȥŸŢ ȸŋ Ȯŋ 0.1 ǦȥÅȓǗ Зŋ ȎȄÈèǿɉä ȮDZɉ ǿÅǪǹɍä ǻÅȞł *.test for sensitivity* ȄÊHǪǚä ȮDZɉ ǿÅǪǹɍä

.ÂȄȽŋ ȸȮȱş ÛȤȄÀǹ ÛÀÀȍÜ ȷȥŸä ǦǺÛǰ ǰǪÅǨ ÜAsTS ȤȽÁǰä ȎȄÈèǿɉä

.(216 ǦHÀȎä Û1963 ÛSRIP) $C_4H_6O_4Zn,2H_2O$ **.Zinc acetate R** ȎǪÂȱä ğÅǪȄèÜ