Procedures involving the IMA Commission on New Minerals and Mineral Names, and guidelines on mineral nomenclature

E. H. NICKEL*
Division of Minerals and Geochemistry, CSIRO, Private Bag, P.O., Wembley, W.A., Australia 6014
AND
J. A. MANDARINO†
Department of Mineralogy and Geology, Royal Ontario Museum, 100 Queen's Park, Toronto, Ontario, Canada M5S 2C6

Introduction

THE Commission on New Minerals and Mineral Names (hereafter abbreviated as CNMMN) of the International Mineralogical Association was established in 1959 for the purpose of controlling mineral nomenclature. All proposals for introducing new minerals, changing mineralogical nomenclature, and discrediting or redefining existing minerals and mineral names should be submitted to the CNMMN for approval before publication. If approval is withheld, the proposal should not be published.

This report incorporates material from previous reports on mineral nomenclature and procedures of the CNMMN (Fleischer, 1970; Donnay and Fleischer, 1970; Embrey and Hey, 1970; Hey and Gottardi, 1980; and Mandarino *et al.*, 1984), and represents an attempt to consolidate this information and to present a comprehensive summary of the subject. Where there are differences between this report and the earlier ones, this version is to be regarded as the correct one.

Submission of proposals

(*a*) If the proposal deals with a new mineral, it should be sent directly to the chairman of the CNMMN. In countries that require a prior review by their national committee, the proposals should first be submitted to the national committee, and subsequently to the CNMMN.

(*b*) All proposals to redefine or discredit existing minerals or mineral names, or to revalidate obsolete names, must be submitted to the vice-chairman of the CNMMN, with a copy to the chairman.

(*c*) If the proposal deals with mineral groups, it should be sent to the secretary of the CNMMN, with a copy to the chairman (the current Secretary is Dr C. E. S. Arps, National Museum of Geology and Mineralogy, Hooglandse Kerkgracht 17, 2312 HS Leiden, The Netherlands).

*Vice-chairman and †chairman, IMA Commission on New Mineral and Mineral Names.

Mineralogical Magazine, April 1988, Vol. 52, pp. 275–292

Nature of the proposal

A proposal should include as many data as possible so that the CNMMN can adequately judge the validity of the proposal. Ideally, a new-mineral proposal should contain the following *information:*

Proposed name and reason for its selection.

Description of the occurrence (geographic and geologic occurrence, paragenesis, and a list of associated minerals, particularly those in apparent equilibrium with the new mineral).

Chemical composition and method of analysis.

Chemical formula—empirical and simplified.

Crystallography—crystal system, crystal class, space group, unit-cell parameters, unit-cell volume, number of formula units per unit cell, X-ray powder data, morphology and crystal structure.

General appearance and physical properties—grain or crystal size, type of aggregate, colour, streak, lustre, transparency, hardness, tenacity, cleavage, parting, fracture, density (calculated and measured).

Optical properties:

(*a*) Non-metallic minerals: optical character (isotropic or anisotropic; uniaxial or biaxial), optical sign, indices of refraction, 2V, dispersion, orientation, pleochroism and absorption.

(*b*) Metallic minerals: colour in reflected light, internal reflections, anisotropy, bireflectance, pleochroism and reflectivity.

Type material (museum where it is deposited).
Relationship to other species.
Any other data that will clarify difficult parts of the description.

It is recognized that it may not always be possible to obtain all the above data; in such cases the author should give reasons for the omissions. To assist potential authors of new-mineral proposals, a check-list should be submitted as part of the proposal. Copies of an official check-list can be obtained from the chairman of the CNMMN or from one of the national representatives. Guidelines on some aspects of mineral proposals are given below.

Criteria for a new mineral name

General considerations. A mineral is generally accepted as being a crystalline substance with defined compositional limits, and which has been formed as the result of geological processes. The essential components in the definition of a mineral are its chemical composition and its crystallographic properties. If a mineral is found whose composition and/or crystallographic properties are substantially different from those of any existing mineral, a new name, if needed, must be proposed to the CNMMN. It is probably not desirable to formulate rigid rules to define whether or not a compositional or crystallographic difference is sufficiently large to require a new mineral name, and each new-mineral proposal must be considered on its own merits. However, a general guideline for compositional criteria is that at least one major structural site should be occupied by a different chemical component than that which occurs in the equivalent site in an existing mineral. But if the presence of an element occurring in a relatively minor amount stabilizes the structure, or if its presence in an occupied site effects a structural change due to charge or size difference, then consideration may be given to a proposal to create a new name for such a mineral. Generally speaking, a crystallographic difference sufficiently large to justify the creation of a new mineral name is one in which the structure of the mineral is topologically different from that of an existing one.

Example: Hydroxyl-apatite and fluorapatite both crystallize in the hexagonal system, with the same space group, and have similar unit-cell parameters. They are considered as separate minerals because the relevant structural site is predominantly occupied by OH in hydroxylapatite, and by F in fluorapatite.

Example: Sphalerite (ZnS) and 'marmatite' ([Zn,Fe]S) are both cubic, with the same space group and similar unit-cell parameters, but they are not regarded as separate minerals because the metal structural site is predominantly occupied by Zn in both cases. Marmatite is regarded as a ferroan variety of sphalerite.

Example: Graphite and diamond both have the same composition, but their structures are topologically different, and therefore minerals such as these deserve separate names.

Polymorphs. Polymorphic minerals are those that have essentially the same chemical compositions, but different crystal structures. Polymorphs are regarded as distinct species and warrant separate mineral names. If the structures of the polymorphs are topologically similar, it is preferable to give the new polymorph a name that is related to that of the existing polymorph (see 'Selection of a Mineral Name', below) rather than giving it a trivial name.

Polytypes. Polytypes have been defined as substances that occur in several different structural modifications, each of which may be regarded as built up by the stacking of layers of (nearly) identical structure and composition, and with the modifications differing only in their stacking sequence (Guinier *et al.*, 1984). Polytypes do not merit new names, but can be distinguished by appropriate suffixes. The modified Gard notation recommended by the International Union of Crystallography (Guinier *et al.*, 1984) is probably more detailed than is necessary for mineral nomenclature, since it is generally necessary only to distinguish between polytypes, not to specify them fully. Consequently, a simplified nomenclature that consists of an italicized suffix comprising an alphabetical character to indicate crystal system, and a numerical symbol to indicate multiplicity of the structural unit, first proposed by Ramsdell (1947), is commonly used. The alphabetical characters recommended by the International Union of Crystallography (Guinier *et al.*, 1984), and now by the CNMMN, are as follows:

cubic	= *C*
hexagonal	= *H*
rhombohedral	= *R*
trigonal	= *T*
tetragonal	= *Q* (quadratic)
orthorhombic	= *O*
monoclinic	= *M*
triclinic	= *A* (anorthic)

Example: Wurtzite-4*H* is a hexagonal polytype with a periodicity of 4 times the *c*-dimension of the wurtzite parent; wurtzite-15*R* is a rhombohedral polytype with a 15-times periodicity.

Although polytypes are not regarded as mineral species, authors are advised to consult with officers of the CNMMN before introducing new polytype names for minerals into the literature.

Regular interstratifications. New names can be given to regular interstratifications where the kinds of layers, their relative proportions, chemical compositions, and regularity of interstratification have been well documented. For detailed criteria that determine whether the interstratification is sufficiently regular to warrant a species name, the reader is referred to Bailey (1981). However, any proposed new name must be submitted to the CNMMN.

Example: The name aliettite has been given to a 1:1 regular interstratification of talc and trioctahedral smectite.

Type specimens

When a new mineral is described, or an existing one redefined, the author should exercise care in defining its type designation, and should ensure that a type specimen is held as permanent reference material by at least one major museum or a nationally recognized mineral collection.

Treatment of a new mineral proposal

When the chairman of the CNMMN receives a new-mineral proposal, he is authorized to write to the author asking for more data when he considers this desirable, or he may point out possible objections either to the mineral or to the name. If the author so desires, the chairman is required to submit a proposal to the CNMMN whether or not he approves of it. In such cases, the chairman will inform the authors that he will give his reasons as to the unsuitability of the proposal under 'Chairman's Remarks'. The chairman's abstract of a proposal is sent by air mail to each member of the CNMMN, and approximately 60 days are allowed for receipt of voting papers.

Members of the CNMMN are urged, not only to vote, but also to comment in detail. The chairman is authorized to suspend voting on a proposal to enable more information to be obtained, or he may call for a second vote on a proposal if, in his opinion, important comments are made by members which should be seen by all the members. Second votes have the same voting periods (about 60 days) and require the same majorities as those for original proposals (see below). Any member of the CNMMN who objects to a proposal may ask the chairman to suspend voting or to call for a new vote, but the final decision to do so rests with the chairman.

Abstracts of proposals dealing with 'ore' minerals may be sent to some members of the IMA's Commission on Ore Mineralogy, at the discretion of the Chairman. Similarly, the chairman may submit abstracts of any proposals to other specialists for advisory opinions. Such advisors do not vote, but their comments are considered by the chairman. Serious objections raised by any advisors are to be treated by the chairman as specified above.

Proposals dealing with minerals belonging to mineral groups for which subcommittees have been organized by the CNMMN may be sent to the appropriate subcommittee chairman for circulation among the subcommittee members if the CNMMN chairman thinks such action is advisable. Subcommittee members are invited to submit opinions, and serious objections raised by them are to be treated as specified above.

If two or more proposals for the same new mineral are received by the chairman, the proposal that arrived first in the chairman's office will have priority.

A proposed new mineral will be considered approved if more than half ($\frac{1}{2}$) of the members of the CNMMN vote on the proposal, and if more than two-thirds ($\frac{2}{3}$) of these members have voted 'yes'. A proposed name will be considered approved if more than half ($\frac{1}{2}$) of the members who vote on the proposal vote 'yes'. In assessing the voting results, an abstention is treated as a negative vote. After voting on a proposal is completed, the chairman sends the results to the CNMMN members and to the author of the proposal. He includes the comments of the voting members, but the votes of individual members are not disclosed. Reconsideration of adverse votes can be requested by an author at any time if *significant new data or new interpretations* are obtained. If a mineral is approved, but not the name, a new name should be requested by the chairman when he notifies the author of the voting results. In cases of repeat voting, approvals of the mineral and the name require the same majorities as in the original voting.

Authors who have described new minerals without names do not have any priority rights on the subsequent naming of such minerals. Any names proposed subsequently have to be approved by the CNMMN, as do the minerals for which the names are proposed.

The publication of non-approved names, or the names of non-approved minerals is not condoned. Non-approved minerals for which descriptions have been published should be treated as *unnamed minerals* and fall under the provisions of the preceding paragraph.

Redefinition, discreditation or revalidation of minerals

Whenever possible, the redefinition or discreditation of a mineral should be based on a study of type material. If a type specimen exists and if the original description, though faulty, represents a reasonable approximation to material on the specimen, the mineral is to be defined by reference to the type material rather than to the original description. This means that errors in the original description cannot be held to discredit a mineral unless the original description was so grossly inaccurate that, in the words of J. D. Dana (1868) 'a recognition of the mineral by means of it is impossible'. If type material cannot be obtained for study, the investigator may propose a neotype to the CNMMN, clearly stating the efforts made to seek the original type specimen. Both the acceptance of the neotype and approval of the proposal are within the authority of the CNMMN.

If a mineral is shown to be a mixture and one of the components is otherwise new, the name should usually be transferred to the new phase; a proposal to do this must also be approved by the CNMMN before publication.

If the original authors of the mineral to be discredited or redefined are alive, the author should write to the original authors asking them to comment on the proposal; these comments should accompany the submission to the CNMMN. The vice-chairman may also choose to contact the original authors independently.

Minor modifications to the definition of a particular mineral do not need to be referred to the CNMMN, but substantial ones do. In general, a redefinition that requires approval by the CNMMN is: (*a*) one that adds or deletes one or more chemical components essential to the definition of the mineral; (*b*) proposes a new compositional limit to a member of a solid-solution series; or (*c*) proposes important changes in the structure of the mineral. In case of doubt, the redefinition proposal should be sent to the vice-chairman of the CNMMN for a ruling.

A mineral name may be discredited if it can be shown that the mineral is identical to another one that has priority, or if the name is misleading. All such cases must be submitted to the vice-chairman of the CNMMN for approval.

Example: A case similar to that of johachidolite (*Am. Mineral.* **62**, 327), in which the elements H, Na and F were found not to be essential to the mineral, requires approval.

Example: A case similar to that of sarcolite (*Mineral. Mag.* **48**, 107), in which it was shown that F is essential to the mineral, requires approval.

Example: A case similar to that of hauchecornite (*Mineral. Mag.* **43**, 873), in which it was shown that ordering of Bi, As, Sb and Te on two structural sites warranted re-definition of the original name and the introduction of three new mineral names for end members, requires approval.

Example: A case similar to that of minerals in the amphibole group, in which compositional limits to members of solid-solution series were proposed (*Am. Mineral.* **63**, 1023), requires approval.

Example: A case similar to that of pierrotite (*Z. Kristallogr.* **165**, 209), in which one S atom was subtracted from the formula, does not require approval because no essential elements are added or deleted, only their proportion has changed. However, if this change had also been accompanied by a change in symmetry of the mineral, then approval would have been required.

Example: A case similar to that of onoratoite, originally described as triclinic, but later found to be monoclinic (*Acta Crystallogr.* **C40**, 1506), requires approval.

Example: A case similar to that of mohsite, which was discredited (*Can. Mineral.* **17**, 635) because re-examination of a type specimen showed that it is essentially similar to crichtonite which has priority over mohsite, requires approval.

Example: A case similar to that of ferroschallerite, which was discredited because re-examination of type material showed that it was not the Fe analogue of schallerite and that it did not have the schallerite structure (*Mineral. Mag.* **48**, 271), requires approval.

A discredited name should not be used in the literature except to report its discreditation. However, if there is evidence that a previously discredited mineral is valid, a proposal to revalidate the name should be submitted to the CNMMN for consideration.

The treatment of proposals for redefinition, discreditation or revalidation is analogous to that for the introduction of a new mineral name, and more than a two-thirds majority is required to approve such proposals.

A list of mineral names discredited by the CNMMN is given as Appendix 1.

Selection of a mineral name

Adjectival modifiers. In mineralogical nomenclature, it is important to distinguish the name proper from adjectival modifiers that may precede

the name and are not connected to it. An adjectival modifier is not considered to be part of the mineral name, and is normally used to indicate a compositional variant, e.g. *ferroan* manganotantalite, where ferroan is the adjectival modifier that indicates the presence of some ferrous iron, and manganotantalite is the name proper. The adjectival modifiers recommended by Schaller (1930) have generally been used in papers published in the English language, but with the greatly increased information about valence states that has become available since that time, it seems appropriate to draw up a new list.

A complete concensus could not be reached by members of the CNMMN on several adjectival modifiers. Although the CNMMN generally recommends that Latin-derived prefixes should be used whenever possible (Hey and Gottardi, 1980), a substantial number of members feel more comfortable with prefixes derived from common English names of chemical elements, e.g. sodium *vs.* natrium and potassium *vs.* kalium. In such cases, either version is regarded as acceptable. Table 1 is a list of adjectival modifiers approved by the CNMMN.

In constructing an adjectival modifier that is not in the table, the ending *oan* is to be used for the ion with the lower valency, and *ian* for the higher. If the valency of an element in a particular mineral is not known, the adjectival modifier derived from the more likely, or more common, valence state of the element should be used.

An adjectival modifier is an adjective that gives some information on the chemistry of the mineral, and is not considered to be a part of the mineral name. Adjectival modifiers should therefore be ignored in the preparation of alphabetical indexes. In some papers, an adjectival modifier is given in the form of a hyphenated chemical prefix, e.g. Li-tosudite, rather than lithian tosudite or lithium-bearing tosudite. Such usage is *incorrect and should be avoided.*

Group and varietal names. A mineral name may be used for a group of minerals, e.g. mica, or for a mineral species, e.g. muscovite. Sometimes the species name is also used as a group name, e.g. the pyrite species is a member of the pyrite group. In the past, varieties of minerals have been given special names, e.g. kunzite (a variety of spodumene), but this practice is not approved.

Name selection. Naming a new mineral is the prerogative and responsibility of the senior author of the proposal submitted to the CNMMN for approval, but the choice of a new name is governed by the following guidelines:

The name must be sufficiently different from existing ones to prevent confusion, both in the author's language and in others. Existing mineral nomenclature already displays a number of examples of unfortunate names are are easily confused; names such as celadonite and caledonite, or mallardite and malladrite can easily be mis-spelled; names such as rhodesite, rhodizite and rhodusite are nearly homophonic. Introduction of new names that can create similar problems must be avoided.

If the new mineral is related to an existing one, it is desirable that this relationship be indicated by the new name, e.g. clinoenstatate for the monoclinic dimorph of enstatite, or magnesiocopiapite for the Mg analogue of copiapite. Such a name should consist of one word only (e.g. magnesiocopiapite, *not* magnesium copiapite).

Efforts should be made to choose a simple name rather than an excessively complicated one that may be difficult to read or pronounce. The use of excessively long names should be avoided, as these may cause difficulties in pronunciation, tabulations, and computer data bases.

The name of a mineral with essential rare-earth elements (or the chemically-related element Y) must have a suffix indicating the dominant rare-earth element, e.g. bastnäsite-(Ce), and if a new mineral with the same structure and analogous composition, but with a different dominant rare-earth element, is discovered, it should be given a name that is analogous to that of the existing mineral, e.g. bastnäsite-(Y). A suffix of this type is known as a 'Levinson modifier' after the author who introduced this procedure (Levinson, 1966). The CNMMN recently decided that the names of all minerals containing essential rare-earth elements, including those introduced into the literature before the publication of Levinson's paper should be changed into the approved format. A list of these mineral names is given as Appendix 2.

In a few cases, a similar procedure has been used for minerals that do not contain rare-earth elements, and which can contain different substituting elements in one or more structural sites, e.g. jahnsite-(CaMnMg). In general, this type of nomenclature is acceptable in cases where only one substituting element is suffixed, but suffixes consisting of multiple elements are conditionally acceptable in cases where the structure is complex, and use of such suffixes simplifies the nomenclature.

Suffixes can also be used to indicate crystallographic relationships. This usage has already been noted in the case of polytypes, but it has also recently been extended to minerals that are not polytypes according to the rigorous definition, e.g. hilgardite-3*Tc* (Ghose, 1985).

Table 1. Adjectival modifiers approved by the CNMMN

Ag	argentian
Al	aluminian
As^{3+}	arsenoan; As^{5+} arsenian; $(AsO_3)^{3-}$ arsenitian; $(AsO_4)^{3-}$ arsenatian
Au	aurian
B	borian; $(BO_3)^{3-}$ boratoan; $(BO_4)^{5-}$ boratian
Ba	barian
Be	beryllian
Bi^{3+}	bismuthoan; Bi^{5+} bismuthian; $(BiO_4)^{5-}$ bismuthatian
Br	bromian; $(BrO_3)^{-}$ bromatian
C	carbonian; $(CO_3)^{2-}$ carbonatian
Ca	calcian
Cd	cadmian
Ce^{3+}	ceroan; Ce^{4+} cerian
Cl	chlorian; $(ClO_3)^{-}$ chloratian
Co^{2+}	cobaltoan; Co^{3+} cobaltian
Cr	chromian; $(CrO_4)^{2-}$ chromatian
Cs	caesian or cesian
Cu^{+}	cuproan; Cu^{2+} cuprian
Dy	dysprosian
Er	erbian
Eu^{2+}	europoan; Eu^{3+} europian
F	fluorian
Fe^{2+}	ferroan; Fe^{3+} ferrian
Fr	francian
Ga	gallian
Gd	gadolinian
Ge	germanian; $(GeO_4)^{4-}$ germanatian
H	hydrogenian; $(OH)^{-}$ hydroxylian; $(H_3O)^{+}$ hydronian or oxonian; H_2O hydrated or hydrous
Hf	hafnian
Hg^{+}	mercuroan; Hg^{2+} mercurian
Ho	holmian
I	iodian; $(IO_3)^{-}$ iodatian
In	indian
Ir	iridian
K	kalian or potassian
La	lanthanian
Li	lithian
Lu	lutecian
Mg	magnesian
Mn^{2+}	manganoan; Mn^{3+} or Mn^{4+} manganian
Mo	molybdian; $(MoO_4)^{2-}$ molybdatian
N	nitrian; $(NO_3)^{-}$ nitratian
NH_4^{-}	ammonian
Na	natrian or sodian
Nb	niobian; $(NbO_4)^{3-}$ niobatian
Nd	neodymian
Ni^{2+}	nickeloan; Ni^{3+} nickelian
O	oxygenian
Os	osmian
P	phosphorian; $(PO_4)^{3-}$ phosphatian
Pb^{2+}	plumboan; Pb^{4+} plumbian
Pd^{2+}	palladoan; Pd^{4+} palladian
Pr	praseodymian
Pt^{2+}	platinoan; Pt^{4+} platinian
Ra	radian
Rb	rubidian
Re	rhenian
Rh	rhodian
Ru	ruthenian
S	sulphurian or sulfurian; $(SO_4)^{2-}$ sulphatian or sulfatian; $(SO_3)^{2-}$ sulphitian or sulfitian
Sb^{3+}	antimonoan or stiboan; Sb^{5+} antimonian or stibian; $(SbO_4)^{3-}$ antimonatian or stibatian
Sc	scandian
Se	selenian; $(SeO_4)^{2-}$ selenatian; $(SeO_3)^{2-}$ selenitian
Si	silician; $(SiO_4)^{4-}$ silicatian
Sm	samarian
Sn^{2+}	stannoan; Sn^{4+} stannian
Sr	strontian
Ta	tantalian
Tb	terbian
Te	tellurian; $(TeO_4)^{2-}$ telluratian; $(TeO_3)^{2-}$ telluritian
Th	thorian
Ti^{3+}	titanoan; Ti^{4+} titanian
Tl^{+}	thalloan; Tl^{3+} thallian
Tm	thulian
U^{4+}	uranoan; U^{6+} uranian; $(UO_2)^{2+}$ uranylian
V^{2+}	vanadoan; V^{5+} vanadian; $(VO_4)^{3-}$ vanadatian; $(VO)^{2+}$ vanadylian
W	wolframian or tungstenian; $(WO_4)^{2-}$ wolframatian or tungstatian
Y	yttrian
Yb	ytterbian
Zn	zincian
Zr	zirconian

Relationships to other minerals can also be indicated by the use of prefixes, e.g. clinoenstatite, the monoclinic dimorph of enstatite; or magnesiochromite, the Mg analogue of chromite. The use of a hyphen to distinguish the prefix from the root name is to be discouraged, but where an unhyphenated name is awkward and a hyphen assists in deciphering the name, it may be used, e.g. hydroxy-bastnäsite-(Ce).

When a chemical prefix is used, Latin-derived prefixes should be used whenever possible, e.g. 'ferro' instead of 'iron', 'plumbo' instead of 'blei', etc. (Hey and Gottardi, 1980).

The prefix is an integral part of the mineral name, and should generally be treated as such in the preparation of alphabetical indexes; however, an exception can be made in the case of prefixed symbols such as Greek letters or their spelled-out Latin equivalents. A recent decision by the CNMMN permits their positioning after the main name; e.g. β-roselite may be written as roselite-β or roselite-beta.

If the mineral is named after a person with a space or a capital letter in the name, the name should be modified to eliminate them, e.g. mcnearite, *not* mcNearite; joesmithite, *not* joe smithite. Otherwise, the original spelling of the person's name should be retained. If the mineral is to be named after a living person, that person's permission must be obtained by the author, and this should be done prior to the submission of the proposal to the CNMMN. When deciding to name a mineral after a person, it is well to recall J. D. Dana's (1854) precept: 'It should be remembered that the use of names of persons eminent in other sciences, or of such as are ignorant of all science, is wholly at variance with good usage and propriety; moreover, an attempted flattery of the politically distinguished is degrading to science, and cannot be too strongly discountenanced'.

Although the CNMMN does not have a fixed policy on the use of compounded personal names, some members feel strongly that they should be discouraged, particularly where they become cumbersome or cacophonous, or where they unnecessarily distort the true names of the individual who is supposedly being honoured.

If the mineral is to be named after a geographical occurrence, care must be taken to ensure that the spelling conforms to that in use at the locality, and should not be taken from translations.

Mineral names proposed in languages that use other than the Latin alphabet shall be transliterated into the Latin alphabet according to the prevalent system operative in the country of origin. In the case of Cyrillic names, transliteration shall follow the British Standard System, which has been adopted by the CNMMN.

Diacritical marks must be retained wherever possible, but it is recognized that not all printing establishments have the necessary facilities for printing all types of diacritical marks; in such cases diacritical marks may be omitted.

Re-use of a discredited or obsolete name for a new or redefined mineral is to be discouraged, except when the new mineral is a component of a mixture originally described as a single mineral; in such a case, the original name may be transferred to the new phase. Re-use of a discredited name may also be permitted if there is a good reason why the discredited name is particularly appropriate for the mineral in question, and the discredited or obsolete name has not appeared in the active literature (except for the report of its discreditation) for *fifty years*. A proposal to re-use an obsolete name must be accompanied or preceded by a proposal to discredit the obsolete name. If the CNMMN does not approve a proposal to re-use a discredited name, the author of the proposal has no priority for the use of the discredited name, although he is free to propose the name again at a future time.

The re-use of an obsolete or discredited name will not be permitted if the name has been used outside the field of mineralogy (e.g. in petrography, metallurgy, palaeontology, etc.), or to indicate two or more minerals.

If an artificial substance has been given a name, and a mineral corresponding to that substance is subsequently discovered, the name given to the artificial substance does not necessarily have to be applied to the mineral.

Publication of the descriptions of approved minerals

Authors of approved proposals should publish descriptions of the minerals covered by these proposals within *two* years of being notified of the approval by the chairman or vice-chairman. If new-mineral descriptions, discreditations, redefinitions or revalidations are not published within that time, the proposals are no longer considered as approved. Any extensions of this deadline must be approved by the chairman or vice-chairman, as appropriate.

Advice to editors

Editors of mineralogical and geological journals will do a service to the Earth Sciences if they cooperate fully with the CNMMN. All aspects of the nomenclature in submitted manuscripts

should be evaluated according to the guidelines given here, and assurance should be sought from authors that they have submitted all matters dealing with mineral nomenclature to the CNMMN, and that their proposals have been approved. Unless they have definite proof of approval, editors should consult with their national representatives, or with members of the CNMMN executive. Editors should be particularly cautious about the final acceptance of a paper bearing phrases like 'has been submitted' or 'will be submitted' to the CNMMN. Acceptance of such papers should be delayed until evidence is produced that the nomenclature *has been approved* by the CNMMN.

In the case of new minerals, editors should insist on evidence that a type specimen of the new mineral has been lodged in at least one major museum or a nationally recognized mineral collection.

It would be appreciated if all journals that publish mineralogical papers included the following statement in their instructions to authors:

'This journal follows the rules of the Commission on New Minerals and Mineral Names of the IMA in all matters concerning mineral names and nomenclature.'

Acknowledgements

National representatives on the CNMMN made substantial contributions to this document by their comments and suggestions during its preparation. The authors are also grateful for helpful suggestions made by Dr P. Bayliss, editor of the JCPDS Mineral Powder Diffraction File.

References

Bailey, S. W. (1981) Nomenclature for regular interstratifications. *Can. Mineral.* **19**, 651–5.

Dana, J. D. (1854) *A System of Mineralogy*, 4th ed., John Wiley & Son, New York.

——(1868) Ibid. 5th ed.

Donnay, G. and Fleischer, M. (1970) Suggested outline for new mineral descriptions. *Am. Mineral.* **55**, 1017–9.

Embrey, P. G. and Hey, M. H. (1970) 'Type' specimens in mineralogy. *Mineral. Record* **1**, 102–4.

Fleischer, M. (1970) Procedure of the International Mineralogical Association Commission on New Minerals and Mineral Names. *Am. Mineral.* **55**, 1016–7.

Ghose, S. (1985) A new nomenclature for the borate minerals in the hilgardite ($Ca_2B_5O_9Cl \cdot H_2O$)–tyretskite ($Ca_2B_5O_9OH \cdot H_2O$) group. Ibid. **70**, 636–7.

Guinier, A. *et al.* (1984) Nomenclature of polytype structures. Report of the International Union of Crystallography *Ad-Hoc* Committee on the Nomenclature of Disordered, Modulated and Polytype Structures. *Acta Crystallogr.* **A40**, 399–404.

Hey, M. H. and Gottardi, C. (1980) On the use of names, prefixes and suffixes, and adjectival modifiers in the mineralogical nomenclature. *Am. Mineral.* **65**, 223–4.

Levinson, A. A. (1966) A system of nomenclature for rare-earth minerals. Ibid. **51**, 152–8.

Mandarino, J. A., Nickel, E. H. and Cesbron, F. (1984) Rules of procedure of the Commission on New Minerals and Mineral Names, International Mineralogical Association. *Am. Mineral.* **69**, 563–4; *Can. Mineral.* **22**, 367–8; *Mineral. Mag.* **48**, 567–8.

Ramsdell, L. S. (1947) Studies on silicon carbide. *Am. Mineral.* **32**, 64–82.

Schaller, W. T. (1930) Adjectival ending of chemical elements used as modifiers to mineral names. Ibid. **15**, 567–74.

[*Manuscript received 30 March 1987; revised 19 May 1987*]

APPENDIX 1: DISCREDITED MINERAL NAMES

Following is a list of mineral names discredited by the CNMMN. The names in the 'Discredited Name' column should not appear in publications; where there is a name in the "Approved Name" column, that should be used instead.

Discredited Name	Approved Name	Reference
Abkhazite	Tremolite	Am. Min. 63 (1978), 1023
Abriachanite	Riebeckite	Am. Min. 63 (1978), 1023
Absite	Brannerite	Am. Min. 48 (1963), 1419
Abukumalite	Britholite-(Y)	Am. Min. 51 (1966), 152
Achrematite	Mixture	Am. Min. 62 (1977), 170
Achromaite	Hornblende	Am. Min. 63 (1978), 1023
Actinote	Actinolite	Am. Min. 63 (1978), 1023
Actynolin	Actinolite	Am. Min. 63 (1978), 1023
Actynolite	Actinolite	Am. Min. 63 (1978), 1023
Adelpholite	Samarskite-(Y)	Am. Min. 51 (1966), 1553
Aktinolitischer tschermakite	Magnesio- or ferro-hornblende	Am. Min. 63 (1978), 1023
Alaskaite	Mixture	Am. Min. 58 (1973), 349
Alazanite		Min. Mag. 43 (1980), 1055
Albrittonite		Am. Min. 67 (1982), 156
Aldzhanite		Min. Mag. 43 (1980), 1055
Alkali-femaghastingsite	Sodian potassian magnesian hastingsite	Am. Min. 63 (1978), 1023
Alkali-ferrohastingsite	Sodian potassian hastingsite	Am. Min. 63 (1978), 1023
Alkali-hastingsite	Sodian potassian (hastingsite to magnesiohastingsite	Am. Min. 63 (1978), 1023
Allcharite	Goethite	Bull. Min. 92 (1969), 99
Allemontite	Stibarsen	Min. Mag. 46 (1982), 513
Allevardite	Rectorite	Am. Min. 49 (1964), 446
Allopalladium	Stibiopalladinite	Am. Min. 63 (1978), 796
Almbosite		this paper
Almerüite	Natroalunite	Min. Mag. 33 (1962), 353
Alpha-catapleite	Gaidonnayite	Can. Min. 16 (1978), 195
Altmarkite		Min. Mag. 43 (1980), 1055
Aluminobetafite		Min. Mag. 36 (1967), 133
Alumobritholite		Min. Mag. 36 (1967), 133
Alumocobaltomelane		Min. Mag. 33 (1962), 261
Alumoferroascharite	Mixture	Am. Min. 49 (1964), 1501
Ameletite	Nepheline & mixture	Min. Mag. 36 (1968), 438
Amiant(h)	Asbestos	Am. Min. 63 (1978), 1023
Amianthinite	Asbestos	Am. Min. 63 (1978), 1023
Amianthoide	Asbestos	Am. Min. 63 (1978), 1023
Amianthus	Asbestos	Am. Min. 63 (1978), 1023
Amosite	Asbestiform grunerite or anthophyllite pre 1948	Am. Min. 63 (1978), 1023
Ampangabeite	Samarskite-(Y)	Min. Mag. 33 (1962), 262
Amphibole-anthophyllite	Cummingtonite	Am. Min. 63 (1978), 1023
Amphibolite	Hornblende	Am. Min. 63 (1978), 1023
Analcite	Analcime	Min. Mag. 43 (1980), 1053
Anarakite		Min. Mag. 43 (1980), 1055
Anauxite	Kaolinite	Am. Min. 54 (1969), 206
Anophorite	Titanian calcian magnesio-arfvedsonite	Am. Min. 63 (1978), 1023
Anthogrammatite	Anthophyllite	Am. Min. 63 (1978), 1023
Anthogrammite	Anthophyllite	Am. Min. 63 (1978), 1023
Antholite	Anthophyllite and cummingtonite	Am. Min. 63 (1978), 1023
Antholith	Anthophyllite	Am. Min. 63 (1978), 1023
Anthophylline	Anthophyllite	Am. Min. 63 (1978), 1023
Anthophyllite rayonné	Anthophyllite	Am. Min. 63 (1978), 1023
Antiglaucophane	Glaucophane or crossite	Am. Min. 63 (1978), 1023
Arfwedsonite	Arfvedsonite	Am. Min. 63 (1978), 1023
Argentocuproaurite		Min. Mag. 43 (1980), 1055
Arsenate-belovite	Talmessite	this paper
Arsenodialytite		Bull. Min. 97 (1974), 520
Asbeferrite	Asbestos	Am. Min. 63 (1978), 1023
Asbestinite	Asbestos	Am. Min. 63 (1978), 1023
Asbestoide	Asbestos	Am. Min. 63 (1978), 1023
Asbestus	Asbestos	Am. Min. 63 (1978), 1023
Asharite	Szajbelyite	this paper
Ashtonite	Strontian mordenite	Min. Mag. 38 (1971), 383
Astochite	Manganoan richterite	Am. Min. 63 (1978), 1023
Astorit(e)	Richterite	Am. Min. 63 (1978), 1023
Astrakanite	Blödite	this paper
Astrolite	Muscovite	Am. Min. 57 (1972), 993
Aurocuprite		Min. Mag. 43 (1980), 1055
Azorpyrrhite		Am. Min. 62 (1977), 403
Bababudanite	Magnesio-riebeckite	Am. Min. 63 (1978), 1023
Badenite	Mixture	Min. Mag. 47 (1983), 411

Balavinskite		Min. Mag. 38 (1971), 103
Barium alumopharmacosiderite		Min. Mag. 38 (1971), 103
Barium pharmacosiderite		Min. Mag. 38 (1971), 103
Barkevicite	Ferroan or ferro-pargasitic hornblende	Am. Min. 63 (1978), 1023
Barkevikite	Ferroan or ferro-pargasitic hornblende	Am. Min. 63 (1978), 1023
Barsanovite	Eucolite	Am. Min. 54 (1969), 1499
Basaltic hornblende	An oxyhornblende, often ferri- or ferrian titanian (magnesio- or magnesian hastingsite)	Am. Min. 63 (1978), 1023
Basaltine	Oxyhornblene + augite	Am. Min. 63 (1978), 1023
Basiliite	Hausmannite + feitknechite	Am. Min. 58 (1973), 562
Bedenite	Ferrian actinolitic hornblende	Am. Min. 63 (1978), 1023
Belovite (of Nefedov)	Talmessite	this paper
Bergamaschite	Hastingsite	Am. Min. 63 (1978), 1023
Bergamaskite	Hastingstite	Am. Min. 63 (1978), 1023
Bergflachs	Asbestos	Am. Min. 63 (1978), 1023
Bergfleisch	Asbestos	Am. Min. 63 (1978), 1023
Berghaar	Asbestos	Am. Min. 63 (1978), 1023
Berghaut	Asbestos	Am. Min. 63 (1978), 1023
Bergholz	Asbestos	Am. Min. 63 (1978), 1023
Bergkork	Asbestos	Am. Min. 63 (1978), 1023
Bergpapier	Asbestos	Am. Min. 63 (1978), 1023
Bergwolle	Asbestos	Am. Min. 63 (1978), 1023
Beryllium sodalite	Tugtupite	Am. Min. 48 (1963), 1178
Beryllosodalite	Tugtupite	Am. Min. 46 (1961), 241
Beta-alumohydrocalcite		Min. Mag. 36 (1967), 133
Beta-brocenite		Min. Mag. 43 (1980), 1055
Beta-lomonosovite		Min. Mag. 36 (1967), 133
Bialite	Wavellite	Min. Mag. 37 (1969), 123
Bidalotite	Gedrite	Am. Min. 63 (1978), 1023
Bisbeeite	Chrysocolla	Min. Mag. 43 (1980), 1054
Biteplapalladite	Merenskyite	this paper
Biteplatinite	Moncheite	this paper
Blanchardite	Brochantite	Am. Min. 58 (1973), 562
Blende	Sphalerite	Min. Mag. 43 (1980), 1053
Bloedite	Blödite	Min. Mag. 33 (1962), 263
Blomstrandite	Uranpyrochlore	Am. Min. 62 (1977), 403
Boleslavite		Min. Mag. 36 (1967), 133
Boodtite	Heterogenite	Min. Mag. 33 (1962), 253
Borgniezite	Sodian amphibole	Am. Min. 63 (1978), 1023
Bořickýite		this paper
Breadalbanite	Hornblende	Am. Min. 63 (1978), 1023
Brocenite	Fergusonite-beta-(Ce)	Min. Mag. 43 (1980), 1055
Bromyrite	Bromargyrite	Min. Mag. 43 (1980), 1053
Brostenite	Birnessite + todorokite	Min. Abst. 74-3408
Buryktalskite		Min. Mag. 33 (1962), 261
Byssolite	Asbestos	Am. Min. 63 (1978), 1023
Cacoclasite	Mixture	Am. Min. 52 (1967), 929
Calafatite	Alunite	Am. Min. 48 (1963), 1184
Calamine	Hemimorphite	Min. Mag. 43 (1980), 1053
Calamite	Tremolite	Am. Min. 63 (1978), 1023
Calciosamarskite	Uranian yttropyrochlore	Am. Min. 62 (1977), 403
Calciotantalite	Mixture	Min. Mag. 38 (1972), 765
Calcium-larsenite	Esperite	Am. Min. 50 (1965), 1170
Calcium-rinkite	Gotzenite	Min. Mag. 33 (1962), 262
Calciumhilgardite-2M(Cc)		Min. Mag. 33 (1962), 261
Calciumhilgardite-3Tc		Min. Mag. 33 (1962), 261
Carinthine	Hornblende	Am. Min. 63 (1978), 1023
Carnevallite		Min. Mag. 43 (1980), 1055
Carphosiderite	Hydronium jarosite	this paper
Carystine	Asbestos	Am. Min. 63 (1978), 1023
Castaingite		Min. Mag. 36 (1967), 133
Cataforite	Katophorite	Am. Min. 63 (1978), 1023
Cataphorite	Katophorite	Am. Min. 63 (1978), 1023
Catophorite	Katophorite	Am. Min. 63 (1978), 1023
Celestite	Celestine	Min. Mag. 43 (1980), 1053
Cerargyrite	Chlorargyrite	Min. Mag. 43 (1980), 1053
Cerolite	Serpentine + stevensite	Am. Min. 50 (1965), 2111
Cerphosphorhuttonite		Min. Mag. 36 (1968), 1144
Ceruranopyrochlore	Cerian pyrochlore	Am. Min. 62 (1977), 403
Chalcolamprite	Impure pyrochlore	Am. Min. 62 (1977), 403
Chalcolite	Torbernite	Min. Mag. 43 (1980), 1053
Challantite	Ferricopiapite	Can. Min. 23 (1985), 53
Chalybite	Siderite	Min. Mag. 43 (1980), 1053
Chengbolite	Moncheite	Min. Mag. 43 (1980), 1055
Chernyshevite	Sodium amphibole	Am. Min. 63 (1978), 1023
Chessylite	Azurite	Min. Mag. 43 (1980), 1053
Chiklite	Manganoan ferri-ferro-	Am. Min. 63 (1978), 1023

	richterite	
Chile-loweite	Humberstonite	Min. Abst. 70-1634
Chlorarsenian	Allactite	Am. Min. 58 (1973), 562
Chlorhastingsite		Min. Mag. 38 (1971), 103
Chloropal	Nontronite	Min. Mag. 43 (1980), 1053
Chlorotile	Agardite-(Y)	Min. Mag. 37 (1970), 954
Chromdisthene		Min. Mag. 38 (1971), 103
Chrome-tremolite	Tremolite or actinolite	Am. Min. 63 (1978), 1023
Chromephlogopite	Phlogopite	Min. Mag. 43 (1980), 1055
Chrominium	Phoenicochroite	Bull. Min. 95 (1972), 427
Chromsteigerite		Min. Mag. 36 (1967), 133
Ci-tyretskite	Hilgardite-	Am. Min. 70 (1985), 636
Clino-anthophyllite	Magnesio-cummingtonite	Am. Min. 63 (1978), 1023
Clinoeulite	Clinoferrosilite	this paper
Clinokupfferite	Cummingtonite	Am. Min. 63 (1978), 1023
Clinostrengite	Phosphosiderite	Min. Mag. 43 (1980), 1053
Clinovariscite	Metavariscite	Min. Mag. 43 (1980), 1053
Cobalt-frohbergite	Frohbergite	this paper
Cobaltocalcite	Spherocobaltite	Min. Mag. 43 (1980), 1053
Cobaltomelane		Min. Mag. 33 (1962), 261
Cocinerite	Mixture	Am. Min. 52 (1967), 1214
Columbomicrolite	Pyrochlore	Am. Min. 62 (1977), 403
Cossyrite	Aenigmatite	Am. Min. 49 (1964), 821
Craigite		Min. Mag. 43 (1980), 1055
Crocidolite	Asbestiform riebeckite	Am. Min. 63 (1978), 1023
Cryptonickelemeiane		Min. Mag. 33 (1962), 261
Cuproartinite		Am. Min. 67 (1982), 156
Cuprohydromagnesite		Am. Min. 67 (1982), 156
Cuprouranite	Torbernite	Min. Mag. 43 (1980), 1053
Cyclowollastonite		Min. Mag. 43 (1980), 1055
Daschkesanit	Chlor potassian hastingsite	Am. Min. 63 (1978), 1023
Dashke(s)sanite	*Chlor potassian* hastingsite	Am. Min. 63 (1978), 1023
Dayingite		Min. Mag. 43 (1980), 1055
Dehrnite	Carbonatian fluorapatite	Min. Mag. 42 (1978), 282
Delatorreite	Todorokite	Min. Mag. 33 (1962), 262
Delorenzite	Tanteuxenite	Min. Mag. 33 (1962), 262
Deltaite	*Mixture*	Min. Mag. 33 (1962), 262
Desmine	Stilbite	Min. Mag. 43 (1980), 1053
Devillite	Devilline	Min. Mag. 43 (1980), 1053
Deweylite	Mixture	Am. Min. 47 (1962), 811
Dhanrasite		Min. Mag. 38 (1971), 103
Dialogite	Rhodochrosite	Min. Mag. 43 (1980), 1053
Diastatite	Hornblende	Am. Min. 63 (1978), 1023
Didymolite	Plagioclase	Am. Min. 50 (1965), 2111
Dillnite	Zunyite	Am. Min. 46 (1961), 1519
Disthène	Cyanite/kyanite	this paper
Dixeyite		Min. Mag. 33 (1962), 261
Djalmaite	Uranmicrolite	Am. Min. 62 (1977), 403
Dosulite		Min. Mag. 43 (1980), 1055
Doverite		Min. Mag. 33 (1962), 261
Doverite	Synchysite-(Y)	Am. Min. 51 (1966), 152
Droogmansite	Kasolite	Bull. Min. 101 (1978), 56
Dzhezkazganite		Min. Mag. 36 (1967), 133
Eardleyite	Takovite	Am. Min. 62 (1977), 458
Ebelmenite	Cryptomelane	Min. Mag. 46 (1982), 513
Eckrite	Winchite	Am. Min. 63 (1978), 1023
Eggonite	Kolbeckite	this paper
Eisenrichterite	Ferro-richterite	Am. Min. 63 (1978), 1023
Ektropite	Caryopilite	Am. Min. 49 (1964), 446
Ellsworthite	Uranpyrochlore	Am. Min. 62 (1977), 403
Ellweilerite		Min. Mag. 33 (1962), 261
Elroquite	Mixture	Am. Min. 48 (1963), 1421
Endeiolite	Impure pyrochlore	Am. Min. 62 (1977), 403
Epidesmine	Stilbite	Am. Min. 53 (1968), 1066
Epigenite	Mixture	Min. Mag. 47 (1983), 411
Epilanthinite	Schoepite	Min. Mag. 33 (1962), 262
Erubescite	Bornite	Min. Mag. 43 (1980), 1053
Exitèle	Valentinite	Min. Mag. 43 (1980), 1053
Fahlerz	Tetrahedrite	Min. Mag. 43 (1980), 1053
Fairbanksite		Min. Mag. 36 (1968), 1144
Fasciculite	Hornblende	Am. Min. 63 (1978), 1023
Feldspath	Feldspar	Min. Mag. 43 (1980), 1053
Felspar	Feldspar	Min. Mag. 43 (1980), 1053
Femaghastingsite	Magnesian hastingsite	Am. Min. 63 (1978), 1023
Femolite		Min. Mag. 36 (1967), 133
Fenghuanglite		Min. Mag. 33 (1962), 261
Fengluanite	Isomertieite	Am. Min. 65 (1980), 408
Feranthophyllite	Ferro-anthophyllite	Am. Min. 63 (1978), 1023
Ferri-edenite	Ferro-edenite	Am. Min. 63 (1978), 1023
Ferri-tremolite	Ferri-ferro-actinolite	Am. Min. 63 (1978), 1023
Ferrian pargasite	Sodian manganoan magnesio-hastingsite	Am. Min. 63 (1978), 1023
Ferriglaucophane	Magnesio-riebeckite	Am. Min. 63 (1978), 1023

Ferrihedrite	Ferri-gedrite	Am. Min. 63 (1978), 1023
Ferripumpellyite	Julgoldite-(Mg)	Can. Min. 12 (1973), 219
Ferririchterite	Manganoan magnesio-arfvedsonite	Am. Min. 63 (1978), 1023
Ferro-tremolite	Ferro-actinolite	Am. Min. 63 (1978), 1023
Ferroalunite		Min. Mag. 36 (1968), 1144
Ferrobabingtonite		Min. Mag. 38 (1971), 103
Ferrofillowite	Johnsomervilleite	this paper
Ferrohalotrichite		Min. Mag. 43 (1980), 1055
Ferrohastingsite	Hastingsite	Am. Min. 63 (1978), 1023
Ferrolizardite		Min. Mag. 36 (1968), 1144
Ferroplatinum	Pt-Fe alloy	Can. Min. 13 (1975), 117
Ferropumpellyite	Pumpellyite-(Fe^{2+})	Can. Min. 12 (1973), 219
Ferrostibian	Langbanite	Am. Min. 53 (1968), 1779
Ferutite	Davidite-(La)	Am. Min. 49 (1964), 447
Feuermineral		Min. Mag. 43 (1980), 1055
Fluochlore	Pyrochlore	Am. Min. 62 (1977), 403
Forbesite	Cobaltoan annabergite + arsenolite	Can. Min. 14 (1976), 414
Foresite	Mixture	Min. Mag. 33 (1962), 262
Foucherite		this paper
Freyalite	Mixture	Am. Min. 70 (1985), 1059
Frigidite	Mixture	Min. Mag. 43 (1979), 99
Gajite	Calcite + brucite	Min. Mag. 33 (1962), 262
Galenobornite		Min. Mag. 36 (1967), 133
Gamsigradite	Manganoan (magnesio-hornblende or edenite)	Am. Min. 63 (1978), 1023
Gastaldite	Glaucophane	Am. Min. 63 (1978), 1023
Gearksite	Gearksutite	Min. Mag. 33 (1962), 262
Gelzircon		Min. Mag. 36 (1967), 133
Gentnerite		Min. Mag. 36 (1968), 1144
Gersbyite	Lazulite	Am. Min. 49 (1964), 1778
Giobertite	Magnesite	Min. Mag. 43 (1980), 1053
Girnarite	Subsilicic titanian sodian magnesian hastingsite	Am. Min. 63 (1978), 1023
Glockerite	Lepidocrocite	Amer. Min. 62 (1977), 599
Glottalite	Chabazite	Min. Mag. 33 (1962), 262
Goongarrite	Cosalite + galena	Am. Min. 49 (1964), 1501
Gouréite	Narsarsukite	Am. Min. 46 (1961), 1521
Grammatit-strahlstein	Tremolite	Am. Min. 63 (1978), 1023
Grammatite	Tremolite	Am. Min. 63 (1978), 1023
Griqualandite	Crocidolite	Am. Min. 63 (1978), 1023
Grossularite	Grossular	Min. Mag. 43 (1980), 1053
Grothine	Norbergite	Min. Rec. 12 (1981), 377
Grünerite	Grunerite	Am. Min. 63 (1978), 1023
Grünlingite	Joseite A / Bismuthinite	Am. Min. 67 (1982), 855
Guanglinite		Min. Mag. 43 (1980), 1055
Gutsevichite		Min. Mag. 33 (1962), 261
Haddamite	Microlite	Am. Min. 62 (1977), 403
Haematite	Hematite	Min. Mag. 43 (1980), 1053
Hanleite	Uvarovite	Min. Mag. 33 (1963), 508
Hatchettolite	Uranpyrochlore	Am. Min. 62 (1977), 403
Heikkolite	Crossite	Am. Min. 63 (1978), 1023
Heikolite	Crossite	Am. Min. 63 (1978), 1023
Henwoodite	Turquoise	Am. Min. 46 (1961), 1520
Herrengrundite	Devilline	Min. Mag. 43 (1980), 1053
Heterotype	Amphibole + pyroxene	Am. Min. 63 (1978), 1023
Heubachite	Nickelian heterogenite	Min. Mag. 33 (1962), 253
Hexabolit	Oxyhornblende	Am. Min. 63 (1978), 1023
Hexagonite	Manganoan tremolite	Am. Min. 63 (1978), 1023
Hexastibiopalladite	Sudburyite	Min. Mag. 43 (1980), 1055
Hillängsite	Dannemorite	Am. Min. 63 (1978), 1023
Hoeferite	Chapmanite	Am. Min. 50 (1965), 2110
Hoepfnerite	Tremolite	Am. Min. 63 (1978), 1023
Hogtveitite	Thalenite-(Y)	Min. Mag. 38 (1971), 102
Holzasbest	Asbestos	Am. Min. 63 (1978), 1023
Hongquiite		this paper
Hormites		Min. Mag. 33 (1962), 261
Hudsonite	Hastingsite	Am. Min. 63 (1978), 1023
Hydrargillite	Gibbsite	Min. Mag. 43 (1980), 1053
Hydroamesite		Min. Mag. 33 (1962), 261
Hydrocalcite (of Marschner)		Min. Mag. 43 (1980), 1055
Hydrocastorite	Mixture	Min. Mag. 33 (1962), 262
Hydrocatapleiite		Min. Mag. 36 (1967), 133
Hydrocerite		Min. Mag. 33 (1962), 261
Hydrochlore	Pyrochlore	Am. Min. 62 (1977), 403
Hydrocyanite	Chalcocyanite	this paper
Hydrohalloysite		Min. Mag. 36 (1967), 133
Hydrokassite		Min. Mag. 36 (1968), 1144
Hydromolysite		Min. Mag. 36 (1968), 1144
Hydronaujakasite		Min. Mag. 38 (1971), 103
Hydropyrochlore	Altered pyrochlore	Am. Min. 62 (1977), 403
Hydrorinkite		Min. Mag. 43 (1980), 1055

Hydrosericite		Min. Mag. 36 (1968), 1144
Hydrosodalite		Min. Mag. 33 (1962), 261
Hydrougrandite		Min. Mag. 36 (1967), 133
Hydroxyl-ascharite		Min. Mag. 36 (1968), 1144
Hydroxyl-szajbelyite		Min. Mag. 36 (1968), 1144
Idocrase	Vesuvianite	this paper
Igalikite	Analcime + muscovite	Min. Mag. 33 (1962), 262
Igdloite	Lueshite	Min. Mag. 33 (1962), 261
Imerinite	Magnesio-arfvedsonite	Am. Min. 63 (1978), 1023
Imgreïte		Min. Mag. 36 (1967), 133
Iodyrite	Iodargyrite	Min. Mag. 43 (1980), 1053
Iron-anthophyllite	Ferro-anthophyllite	Am. Min. 63 (1978), 1023
Iron-hornblende	Oxy-manganoan potassian ferrian ferro-hornblende	Am. Min. 63 (1978), 1023
Iron-richterite	Ferro-richterite	Am. Min. 63 (1978), 1023
Isabellite	Richterite	Am. Min. 63 (1978), 1023
Ishiganeite	Cryptomelane + birnessite	Am. Min. 49 (1964), 448
Isoplatinocopper		Min. Mag. 43 (1980), 1055
Isowolframite		Min. Mag. 43 (1980), 1055
Jenkinsite	Ferroan antigorite	Am. Min. 47 (1962), 783
Ježekite	Morinite	Am. Min. 47 (1962), 398
Jiningite		Min. Mag. 33 (1962), 261
Johnstonotite	Spessartine	Am. Min. 53 (1968), 1065
Juddite	Manganoan magnesio-arfvedsonite	Am. Min. 63 (1978), 1023
Julgoldite	Julgoldite-(Fe^{2+})	Can. Min. 12 (1973), 219
Kalamite	Tremolite	Am. Min. 63 (1978), 1023
Kalio-magnesio-katophorit	Titanian potassian richterite	Am. Min. 63 (1978), 1023
Kamarezite	Brochantite	Am. Min. 50 (1965), 1450
Kanaekanite		Min. Mag. 46 (1982), 514
Karinthin	Hornblende, often pargasitic hornblende	Am. Min. 63 (1978), 1023
Karpinskyite	Mixture	Am. Min. 57 (1972), 1006
Khlopinite	Samarskite-(Y)	Am. Min. 57 (1972), 329
Khuniite	Iranite	Am. Min. 61 (1976), 186
Kidney stone	Actinolite	Am. Min. 63 (1978), 1023
Kievite	Cummingtonite	Am. Min. 63 (1978), 1023
Killinite	Hydromuscovite	Min. Mag. 48 (1984), 566
Kirwanite	Impure altered hornblende	Am. Min. 63 (1978), 1023
Kivuite		Min. Mag. 33 (1962), 261
Kleberite		this paper
Klipsteinite	Neotocite	Min. Mag. 42 (1978), 279
Kmaite		*Min. Mag. 36 (1967)*, 133
Knipovichite	Alumohydrocalcite	Am. Min. 61 (1976), 341
Kokscharovite	Edenitic amphibole	Am. Min. 63 (1978), 1023
Kokscharowit	Edenitic amphibole	Am. Min. 63 (1978), 1023
Koiskite	Lizardite + sepiolite	Am. Min. 59 (1974), 212
Koppite	Pyrochlore	Am. Min. 62 (1977), 403
Kozhanovite	Karnasurtite	Min. Mag. 33 (1962), 262
Krokidolite	Crocidolite	Am. Min. 63 (1978), 1023
Krokydolith	Crocidolite	Am. Min. 63 (1978), 1023
Kupfferite (Allen & Clement)	Magnesio-anthophyllite	Am. Min. 63 (1978), 1023
Kupfferite (Hermann)	Chromian anthophyllite	Am. Min. 63 (1978), 1023
Kupfferite (Koksharov)	Chromian anthophyllitic amphibole	Am. Min. 63 (1978), 1023
Kurgantaite	Strontian tyretskite + celestine	Min. Mag. 46 (1982), 514
Kusuite	Wakefieldite-(Ce)	Bull. Min. 109 (1986), 30
Kyanophyllite	Paragonite + muscovite	Am. Min. 58 (1973), 807
Kymatine	Asbestos	Am. Min. 63 (1978), 1023
Labrador hornblende	Orthopyroxene	Am. Min. 63 (1978), 1023
Lamprobolite	Oxyhornblende	Am. Min. 63 (1978), 1023
Lamprostiblan	*Melanostibian*	Am. Min. 53 (1968), 1779
Laneite	Ferroan or ferro-pargasitic hornblende	Am. Min. 63 (1978), 1023
Lavrovite	Chromian diopside	N.Jb.Min.Mh. (1979), 189
Lazarevićite		Min. Mag. 33 (1962), 261
Leonhardtite	Starkeyite	Min. Rec. 6 (1975), 144
Lesserite	Inderite	Min. Mag. 33 (1962), 262
Lewistonite	Carbonatian fluorapatite	Min. Mag. 42 (1978), 282
Linosite	Ferri- or ferrian oxy-kaersutite	Am. Min. 63 (1978), 1023
Lithionglaukophan	Holmquistite	Am. Min. 63 (1978), 1023
Lithium-amphibole	Lithian amphibole, holmquistite and clino-holmquistite	Am. Min. 63 (1978), 1023
Liujinyinite	Uytenbogaardtite	this paper
Lodochnikite	Brannerite	Am. Min. 48 (1963), 1419
Lorettoite		Am. Min. 64 (1979), 1303
Macrokaolinite		Min. Mag. 43 (1980), 1055

Maganthophyllite	Magnesio-anthophyllite	Am. Min. 63 (1978), 1023
Magnesia-arfvedsonite	Magnesio-arfvedsonite	Am. Min. 63 (1978), 1023
Magnesian glaucophane	Glaucophane	Am. Min. 63 (1978), 1023
Magnesiolaumontite		Min. Mag. 36 (1967), 133
Magnesium anthophyllite	Magnesio-anthophyllite	Am. Min. 63 (1978), 1023
Magnesium szomolnokite		Min. Mag. 33 (1962), 261
Magnetostibian	Jacobsite	Am. Min. 58 (1973), 562
Magnioborite	Suanite	Am. Min. 48 (1963), 915
Magnodravite		Min. Mag. 36 (1968), 1144
Magnophorite	Titanian potassian richterite	Am. Min. 63 (1978), 1023
Maigruen		Min. Mag. 43 (1980), 1055
Mangan amphibole	Rhodonite	Am. Min. 63 (1978), 1023
Manganandalusite	Manganoan andalusite	this paper
Mangan crocidolite	Manganoan riebeckite	Am. Min. 63 (1978), 1023
Mangan krokidolith	Manganoan riebeckite	Am. Min. 63 (1978), 1023
Mangan-actinolite	Manganoan actinolite	Am. Min. 63 81978), 1023
Mangan-tremolite	Manganoan tremolite	Am. Min. 63 (1978), 1023
Mangano-anthophyllite	*Tirodite*	Am. Min. 63 (1978), 1023
Manganomelane	Psilomelane	Min. Mag. 46 (1982), 513
Manganomossite	Manganocolumbite	Min. Mag. 33 (1962), 262
Manganosteenstrupine		Min. Mag. 33 (1962), 261
Manganseverginite		Min. Mag. 38 (1971), 103
Mangantapiolite	Manganotapiolite	Am. Min. 70 (1985), 217
Manganuralite	Manganoan magnesio-arfvedsonite	Am. Min. 63 (1978), 1023
Marignacite	Ceriopyrochlore-(Ce)	Am. Min. 62 81977), 403
Marmairolite	Manganoan richterite	Am. Min. 63 (1978), 1023
Matorolite		Min. Mag. 38 (1971), 103
Mboziite	Potassian taramite	Am. Min. 63 (1978), 1023
Medmontite	Chrysocolla + mica	Am. Min. 54 (1969), 994
Melaconite	Tenorite	Min. Mag. 43 (1980), 1053
Melnikovite	Greigite	Min. Mag. 46 (1982), 513
Mendelejevite	Betafite	Am. Min. 62 (1977), 403
Mendelyeevite	Betafite	Am. Min. 62 (1977), 403
Metajennite		Min. Mag. 36 (1968), 1144
Metaliebigite		Min. Mag. 38 (1971), 103
Metalomonosovite	Beta-lomonosovite	Am. Min. 48 (1963), 1413
Metamurmanite		Min. Mag. 36 (1967), 133
Metasimpsonite	Microlite	Am. Min. 62 (1977), 403
Metastrengite	Phosphosiderite	Min. Mag. 43 (1980), 1053
Mindigite	Heterogenite	Min. Mag. 33 (1962), 253
Minguettite	Stilpnomelane	Am. Min. 54 (1969), 1223
Miomirite		Min. Mag. 43 (1980), 1055
Miropolskite		Min. Mag. 43 (1980), 1055
Mispickel	Arsenopyrite	Min. Mag. 43 (1980), 1053
Miyashiroite		Min. Mag. 36 (1968), 1144
Mohsite	Crichtonite	Can. Min. 17 (1979), 635
Montasite	Asbestiform grunerite	Am. Min. 63 (1978), 1023
Montdorite		this paper
Mossite	Tantalian ferrocolumbite	Min. Mag. 43 (1979), 553
Mountain wood	Asbestos	Am. Min. 63 (1978), 1023
Mozambikite		Min. Mag. 33 (1962), 261
Mrazekite		Min. Mag. 43 (1980), 1055
Mumbite	Plumbomicrolite	Am. Min. 62 (1977), 403
Munkforssite	Manganiferous apatite	Am. Min. 49 (1964), 1778
Munkrudite	Cyanite/Kyanite	Am. Min. 49 (1964), 1778
Murgocite		Min. Mag. 43 (1980), 1055
Nakasêite		Min. Mag. 33 (1962), 261
Namaqualite	Cyanotrichite	Min. Mag. 32 (1961), 737
Natrongrammatit	Richterite	Am. Min. 63 (1978), 1023
Natronrichterite	Manganoan richterite	Am. Min. 63 (1978), 1023
Naurodite	Alkali amphibole	Am. Min. 63 (1978), 1023
Nenadkevite	Mixture	Am. Min. 62 (1977), 1261
Neodigenite	*Digenite*	Min. Mag. 43 (1980), 1053
Neotantalite	Microlite	Am. Min. 62 (1977), 403
Nephrite	Actinolite	Am. Min. 63 (1978), 1023
Niccolite	Nickeline	Min. Mag. 43 (1980), 1053
Nickelemelane		Min. Mag. 33 (1962), 261
Nickelite	Nickeline	Min. Mag. 43 (1980), 1053
Niobozirconolite	Zirkelite	Am. Min. 62 (1977), 403
Niobpyrochlore	Pyrochlore	Am. Min. 62 (1977), 403
Niobtantalpyrochlore	Pyrochlore/microlite	Am. Min. 62 (1977), 403
Nitroglauberite	Darapskite	Am. Min. 55 (1970), 776
Noonkanbahite		Min. Mag. 36 (1968), 1144
Noralite	Ferro-hornblende	Am. Min. 63 (1978), 1023
Nordenskiöldite	Tremolite	Am. Min. 63 (1978), 1023
Nuolaite	Mixture	Am. Min. 62 (1977), 403
Obruchevite	Yttropyrochlore	Am. Min. 62 (1977), 403
Octahedrite	Anatase	Min. Mag. 43 (1980), 1053
Oligiste	Hematite	Min. Mag. 43 (1980), 1053
Olovotantalite		Min. Mag. 36 (1967), 133
Ondrejite	Huntite + magnesite	Am. Min. 49 (1964), 1502
Opsimose	Neotocite	Min. Mag. 42 (1978), 279
Orizite	Epistilbite	Am. Min. 57 (1972), 592

Orniblende	Hornblende	Am. Min. 63 (1978), 1023
Orthite	Allanite	this paper
Ortho-armalcolite		Min. Mag. 43 (1980), 1055
Ortholomonosovite	Lomonosovite	Am. Min. 48 (1963), 1413
Orthorhombic lamprophyllite		Min. Mag. 36 (1968), 1144
Orthorhombic lavenite		Min. Mag. 36 (1968), 1144*
Orthoriebeckite	Riebeckite	Am. Min. 63 (1978), 1023
Orthose	Orthoclase	Min. Mag. 43 (1980), 1053
Orthozoisite		Min. Mag. 38 (1971), 103
Oryzite	Epistilbite	Am. Min. 57 (1972), 592
Osannite	Riebeckite	Am. Min. 63 (1978), 1023
Osumilite-(K,Mg)		Min. Mag. 43 (1980), 1055
Oxyferropumpellyite	Pumpellyite-(Fe^{3+})	Can. Min. 12 (1973), 219
Oxyjuigoidite	Juigoidite-(Fe^{3+})	Can. Min. 12 (1973), 219
Palladiumarsenostannide		this paper
Panabase	Tetrahedrite	Min. Mag. 43 (1980), 1053
Pandaite	Bariopyrochlore	Am. Min. 62 (1977), 403
Para-armalcolite		Min. Mag. 43 (1980), 1055
Para-boleite		Min. Mag. 43 (1980), 1055
Parahilgardite	Hilgardite-	Am. Min. 70 (1985), 636
Parapectolite		Min. Mag. 43 (1980), 1055
Paraphane		*Min. Mag. 36 (1968), 1144*
Parastrengite		Min. Mag. 43 (1980), 1055
Paravariscite		Min. Mag. 43 (1980), 1055
Parawollastonite		Min. Mag. 33 (1962), 263
Paulite		Min. Mag. 33 (1962), 261
Pendletonite	Carpathite	Am. Min. 54 (1969), 329
Penwithite	Neotocite	Min. Mag. 42 (1978), 279
Pharaonite	Davyne	Min. Mag. 43 (1980), 1055
Philipstadite	Ferrian ferro-hornblende	Am. Min. 63 (1978), 1023
Phosphochromite	Ferrian variscite	Am. Min. 48 (1963), 1421
Phosphothorogummite		Min. Mag. 38 (1971), 103
Pianlinite		this paper
Picroamosite	Ferrian anthophyllite	Am. Min. 63 (1978), 1023
Piedmontite	Piemontite	Min. Mag. 43 (1980), 1053
Pilinite	Bavenite	Min. Mag. 33 (1962), 262
Pilite	Actinolite pseudomorph	Am. Min. 63 (1978), 1023
Pleonectite	Hedyphane	Am. Min. 58 (1973), 562
Pleurasite	Mixture	Am. Min. 58 (1973), 562
Plinthite	Mixture	Min. Mag. 33 (1962), 262
Plumalsite		Min. Mag. 38 (1971), 103
Plumangite		Min. Mag. 43 (1980), 1055
Plumboallophane		Min. Mag. 43 (1980), 1055
Plumbozincocalcite		Min. Mag. 38 (1971), 103
Polianite	Pyrolusite	Min. Mag. 46 (1982), 513
Polyxene		Can. Min. 13 (1975), 117
Pravdite	Altered britholite	Am. Min. 49 (1964), 1501
Priorite	Aeschynite-(Y)	Am. Min. 51 (1966), 152
Prismatic schillerspar	*Anthophyllite*	*Am. Min. 63 (1978), 1023*
Proarizonite		Min. Mag. 36 (1967), 133
Protopartzite		Min. Mag. 38 (1971), 103
Pseudo-aenigmatite		Min. Mag. 36 (1968), 1144
Pseudoautunite		Min. Mag. 36 (1968), 1144
Pseudoglaucophane	Glaucophane or crossite	Am. Min. 63 (1978), 1023
Pseudoixiolite	Ixiolite	Can. Min. 14 (1976), 540
Pseudomesolite	Mesolite	Min. Mag. 49 (1985), 103
Pseudonatrolite	Mordenite	Min. Mag. 33 (1962), 262
Psilomelane	Romanechite	Min. Mag. 46 (1982), 513
Pumpellyite	Pumpellyite-(Mg)	Can. Min. 12 (1973), 219
Pyrochlore-microlite	Pyrochlore or microlite	Am. Min. 62 (1977), 403
Pyrochlore-wiikite	Mixture	Am. Min. 62 (1977), 403
Pyrrhite		Am. Min. 62 (1977), 403
Pyrrhoarsenite	Berzeliite	Am. Min. 58 (1973), 562
Raphilite	Tremolite	Am. Min. 63 (1978), 1023
Raphisiderite	Hematite	Am. Min. 53 (1968), 1060
Retinostibian		Bull. Min. 97 (1974), 520
Revoredite		Min. Mag. 33 (1962), 262
Rezhikite	Magnesio-riebeckite or magnesio-arfvedsonite	Min. Mag. 33 (1962), 261
Rhenium		this paper
Rhodoarsenian	Rhodonite	Am. Min. 58 (1973), 562
Rhodusite	Magnesio-riebeckite	Am. Min. 63 (1978), 1023
Rhombomagnojacobsite		Min. Mag. 36 (1967), 133
Rijkeboerite	Bariomicrolite	Am. Min. 62 (1977), 403
Rimpylite	Hornblende	Am. Min. 63 (1978), 1023
Rogersite	*Churchite*	*Am. Min. 48 (1963), 1168*
Roseite		Min. Mag. 38 (1971), 103
Royite	Alpha-quartz	Am. Min. 47 (1962), 1223
Rutherfordite	Rutherfordine	Min. Mag. 43 (1980), 1053
Salmonsite	Hureaulite + jahnsite	Min. Mag. 42 (1978), 309
Samiresite	Plumbian uranpyrochlore	Am. Min. 62 (1977), 403
Sangarite		Min. Mag. 36 (1967), 133
Scheibeite (of Mücke)	Phoenicochroite	Am. Min. 56 (1971), 359,
Scheteligite		Am. Min. 62 (1977), 403

Schmeiderite	Schmiederite	Min. Mag. 43 (1980), 1054
Schoenite	Picromerite	this paper
Schönite	Picromerite	this paper
Schuchardtite	Vermiculite-chlorite	Am. Min. 64 (1979), 1334
Schulzenite	Cuprian heterogenite	Min. Mag. 33 (1962), 253
Sebesite	Tremolite	Am. Min. 63 (1978), 1023
Selenjoseite	Laitakarite	Am. Min. 498 (1963), 1421
Septetalc-chlorite	Baumite	Am. Min. 61 (1976), 174
Shachialite		this paper
Shentullite		Min. Mag. 33 (1962), 261
Silbőlite	Actinolite	Am. Min. 63 (1978), 1023
Siifbergite	Dannemorite	Am. Min. 63 (1978), 1023
Silicate-wiikite	Mixture	Am. Min. 62 (1977), 403
Silicomanganberzeliite		Min. Mag. 36 (1968), 1144
Silicomonazite		Min. Mag. 43 (1980), 1055
Silicorhabdophane		Min. Mag. 36 (1967), 133
Sillbőlite	Actinolite	Am. Min. 63 (1978), 1023
Simpsonite	Titanian potassian richterite	Am. Min. 63 (1978), 1023
Sjögrufvite	Caryinite	Am. Min. 58 (1973), 562
Slavyanskite	Tunisite	Z.V.M.O. 110 (1981), 96
Smaragdite	Actinolite or hornblende	Am. Min. 63 (1978), 1023
Smaragditic grammatite	Tremolite	Am. Min. 63 (1978), 1023
Smaragditic tschermakite	Tschermakite or tschermakitic hornblende	Am. Min. 63 (1978), 1023
Sobotkite	Saponite	this paper
Soda	Natron	Min. Mag. 43 (1980), 1053
Soda asbestos	Magnesio-arfvedsonite	Am. Min. 63 (1978), 1023
Soda hornblende	Arfvedsonite	Am. Min. 63 (1978), 1023
Soda niter	Nitratine	Min. Mag. 43 (1980), 1053
Soda nitre	Nitratine	Min. Mag. 43 (1980), 1053
Soda richterite	Manganoan richterite	Am. Min. 63 (1978), 1023
Soda tremolite	Richterite	Am. Min. 63 (1978), 1023
Sodium phlogopite		this paper
Sokolovite		Min. Mag. 33 (1962), 261
Soretite	Magnesian hastingsite	Am. Min. 63 (1978), 1023
Spencite	Tritomite-(Y)	Am. Min. 51 (1966), 152
Spessartite	Spessartine	Min. Mag. 43 (1980), 1053
Speziatite	Hornblende	Am. Min. 63 (1978), 1023
Sphaerocobaltite	Spherocobaltite	Min. Mag. 43 (1980), 1053
Sphene	Titanite	Min. Mag. 46 (1982), 513
Stannoluzonite		Min. Mag. 36 (1967), 133
Sterretite	Kolbeckite	this paper
Stibiodufrenoysite		Min. Mag. 38 (1971), 103
Stibiomicrolite	Mixture	Am. Min. 62 (1977), 403
Stibiopearceite	Antimonpearceite	this paper
Stipoverite		Min. Mag. 36 (1967), 133
Strahlstein	Actinolite	Am. Min. 63 (1978), 1023
Stratopeite	Neotocite	Min. Mag. 42 (1978), 279
Strelite	Actinolite or anthophyllite	Am. Min. 63 (1978), 1023
Strontiohilgardite	Strontian tyretskite	Min. Mag. 46 (1982), 514
Strontiohilgardite-1Tc		Min. Mag. 33 (1962), 261
Strontium thomsonite		Min. Mag. 36 (1968), 1144
Subglaucophane	Crossite	Am. Min. 63 (1978), 1023
Sukulaite	Stannomicrolite	Am. Min. 62 (1977), 403
Sulphate-monazite		Min. Mag. 36 (1967), 133
Suluite		Min. Mag. 33 (1962), 261
Sundiusite		Min. Mag. 36 (1968), 1144
Sungulite	Lizardite + sepiolite	Am. Min. 59 (1974), 212
Svidneite	Oxy magnesio-riebeckite	Am. Min. 63 (1978), 1023
Svitalskite	Celadonite	Am. Min. 63 (1978), 796
Syntagmatite (Troger, 1952)	Titanian hastingsite	Am. Min. 63 (1978), 1023
Szechenyiite	Richterite	Am. Min. 63 (1978), 1023
Szechonyit	Richterite	Am. Min. 63 (1978), 1023
Taaffeite-9R	Musgravite	Am. Min. 69 (1984), 215
Taiyite	Aeschynite-(Y)	Min. Mag. 43 (1980), 1055
Tangaite	Redondite	Am. Min. 49 (1964), 445
Tangenite		Am. Min. 62 (1977), 403
Tantalbetafite	Betafite	Am. Min. 62 (1977), 403
Tantalhatchettolite	Uranmicrolite	Am. Min. 62 (1977), 403
Tantalo-obruchevite		Am. Min. 62 (1979), 403
Tantalpyrochlore	Microlite	Am. Min. 62 (1977), 403
Tantalum		Am. Min. 47 (1962), 786
Tanzanite		Min. Mag. 43 (1980), 1055
Taprobanite	Taaffeite	Min. Mag. 46 (1982), 514
Tarasovite		Am. Min. 67 (1982), 394
Tatarkaite	Ripidolite	Am. Min. 50 (1965), 2111
Tavistockite	Apatite	Min. Mag. 37 (1969), 123
Taylorite	Ammonian arcanite	Can. Min. 23 (1985), 259
Teremkovite		Min. Mag. 38 (1971), 103
Ternovskite	Magnesio-riebeckite	Am. Min. 63 (1978), 1023
Tetrakalsilite	Panunzite	N.Jb.Min.Mh. (1985), 322
Texasite		Am. Min. 67 (1982), 156

Thalackerite	Anthophyllite	Am. Min. 63 (1978), 1023
Thierschite	Whewellite	Am. Min. 47 (1962), 786
Thorgadolinite		Min. Mag. 43 (1980), 1055
Thoroaeschynite		Min. Mag. 36 (1968), 1144
Tibergite	Manganoan sodian magnesio-hastingsite	Am. Min. 63 (1978), 1023
Tin-tantalite		Min. Mag. 36 (1967), 133
Titanbetafite	Betafite	Am. Min. 62 (1977), 403
Titanhornblende	Aenigmatite	Am. Min. 63 (1978), 1023
Titanmicrolite		Am. Min. 62 (1977), 403
Titano-aeschynite		Min. Mag. 36 (1967), 133
Titano-obruchevite	Yttrobetafite-(Y)	Am. Min. 62 (1977), 403
Titanopyrochlore	Mixture	Am. Min. 62 (1977), 403
Titanorhabdophane		Min. Mag. 36 (1967), 133
Toddite	Columbite + samarskite	Am. Min. 47 (1962), 1363
Tonerdehaltiger strahlstein	Tremolite	Am. Min. 63 (1978), 1023
Torendrikite	Magnesio-riebeckite	Am. Min. 63 (1978), 1023
Tozalite		Min. Mag. 43 (1980), 1055
Transvaalite	Heterogenite	Min. Mag. 33 (1962), 253
Tremolite-glaucophane	Richterite	Am. Min. 63 (1978), 1023
Triphane	*Spodumene*	*Min.* Mag. 43 (1980), 1053
Trudellite	Natroalunite + chloraluminite	Am. Min. 57 (1972), 1317
Tsavolite	Grossular	this paper
Tschernischewit	Sodium amphibole	Am. Min. 63 (1978), 1023
Tucanite		Min. Mag. 36 (1968), 1144
Turite		Min. Mag. 36 (1968), 1144
Tynite		Min. Mag. 36 (1967), 133
Tyretskite	Tyretskite-1Tc	Am. Min. 70 (1985), 636
Udokanite		Min. Mag. 43 (1980), 1055
Uduminelite		Min. Mag. 39 (1974), 929
Ufertite	Davidite-(La)	Am. Min. 49 (1964), 447
Uigite	Thomsonite + gyrolite	Min. Mag. 33 (1962), 262
Uralite	Actinolite pseudomorph	Am. Min. 63 (1978), 1023
Uranglimmer	Uranite	Min. Mag. 43 (1980), 1053
Uranmica	Uranite	Min. Mag. 43 (1980), 1053
Uranoanatase		Min. Mag. 36 (1968), 1144
Ureyite	Kosmochlor	this paper
Uzbekite	Volborthite	Am. Min. 50 (1965), 2111
Vallachite		Min. Mag. 38 (1971), 103
Valleite	Calcian manganoan anthophyllite	Am. Min. 63 (1978), 1023
Vanuranylite		Min. Mag. 36 (1968), 1144
Velikite		Min. Mag. 43 (1980), 1055
Vernadskite	Antlerite	Am. Min. 46 (1961), 146
Viridine	Manganoan andalusite	Zts. Krist. 155 (1981), 8
Waldheimite	Richterite	Am. Min. 63 (1978), 1023
Wallerian	Hornblende	Am. Min. 63 (1978), 1023
Warthaite	Cosalite + galena	Am. Min. 49 (1964), 1501
Wathlingite	*Kieserite*	Am. Min. 47 (1962), 811
Wehrlite	Mixture	Am. Min. 69 (1984), 215
Weibyeite	Bastnäsite + ancylite	Am. Min. 49 (1964), 1154
Wellerite		Min. Mag. 36 (1967), 133
Weinschenkite (of Laubman)	Churchite-(Y)	Min. Mag. 46 (1982), 513
Weinschenkite (of Murgoci)	Ferri-magnesio-hornblende or magnesio-hastingsite	Am. Min. 63 (1978), 1023
Westgrenite	Bismutomicrolite	Am. Min. 62 (1977), 403
Wiikite	Mixture	Am. Min. 62 (1977), 403
Wilkeite	Apatite/fluorellestadite	Min. Mag. 46 (1982), 514
Wittingite	Neotocite	Min. Mag. 42 (1978), 279
Wolframoixiolite		Min. Mag. 43 (1980), 1055
Woodfordite	Ettringite	Min. Mag. 33 (1962), 262
Yamatoite		Min. Mag. 36 (1967), 133
Yanzhongite	Kotulskite	Min. Mag. 43 (1980), 1055
Yenshanite	Vysotskite	Min. Mag. 43 (1980), 1055
Yftisite		this paper
Yokosukaite	Nsutite	Am. Min. 49 (1964), 448
Yttrohatchettolite	Yttropyrochlore-(Y)	Am. Min. 62 (1977), 403
Yttromicrolite		Am. Min. 67 (1982), 156
Zeiringite	Aragonite + aurichalcite	Am. Min. 48 (1963), 1184
Zeyringite	*Aragonite + aurichalcite*	*Am. Min.* 48 (1963), 1184
Zillerite	Actinolite	Am. Min. 63 (1978), 1023
Zillerthite	Actinolite	Am. Min. 63 (1978), 1023
Zinc-manganese-cummingtonite	Zinc tirodite	Am. Min. 63 (1978), 1023
Zincalunite		Min. Mag. 36 (1967), 133
Zincblende	Sphalerite	Min. Mag. 43 (1980), 1053
Zirconolite	Zirkelite	Am. Min. 62 (1977), 403
Zirlite	Gibbsite	Am. Min. 47 (1962), 1223
Zirsite		Min. Mag. 36 (1967), 133

APPENDIX 2: REVISED NOMENCLATURE FOR RARE-EARTH MINERALS

Original Name	Revised Name
Aeschynite	Aeschynite-(Ce)
Aeschynite-(Nd)	
Agardite	Agardite-(Y)
Agardite-(La)	
Allanite	Allanite-(Ce)
Allanite	Allanite-(La)
Allanite-(Y)	
Ancylite	Ancylite-(Ce)
Ashcroftine	Ashcroftine-(Y)
Bastnäsite	Bastnäsite-(Ce)
Bastnäsite-(La)	
Bastnäsite-(Y)	
Bijvoetite	Bijvoetite-(Y)
Braitschite	Braitschite-(Ce)
Britholite	Britholite-(Ce)
Britholite-(Y)	
Calcioancylite	Calcioancylite-(Ce)
Calkinsite	Calkinsite-(Ce)
Cappelenite	Cappelenite-(Y)
Caysichite	Caysichite-(Y)
Cebaite	Cebaite-(Ce)
Cerianite	Cerianite-(Ce)
Ceriopyrochlore	Ceriopyrochlore-(Ce)
Cerite	Cerite-(Ce)
Cerotungstite	Yttrotungstite-(Ce)
Chernovite	Chernovite-(Y)
Chevkinite	Chevkinite-(Ce)
Chukhrovite	Chukhrovite-(Y)
Chukhrovite-(Ce)	
Churchite	Churchite-(Y)
Cordylite	Cordylite-(Ce)
Daqingshanite	Daqingshanite-(Ce)
Davidite	Davidite-(Ce)
Davidite	Davidite-(Y)
Davidite	Davidite-(La)
Donnayite	Donnayite-(Y)
Euxenite	Euxenite-(Y)
Ewaldite	Ewaldite-(Y)
Fergusonite	Fergusonite-(Y)
Fergusonite-beta	Fergusonite-beta-(Y)
Fergusonite-beta-(Ce)	
Fergusonite-beta-(Nd)	
Florencite	Florencite-(Ce)
Florencite-(La)	
Florencite-(Nd)	
Fluocerite	Fluocerite-(Ce)
Fluocerite-(La)	
Formanite	Formanite-(Y)
Gadolinite	Gadolinite-(Y)
Gadolinite-(Ce)	
Gagarinite	Gagarinite-(Y)
Gysinite	Gysinite-(Nd)
Hellandite	Hellandite-(Y)
Hingganite	Hingganite-(Y)
Hingganite-(Yb)	
Huanghoite	Huanghoite-(Ce)
Hydroxyl-bastnäsite	Hydroxyl-bastnäsite-(Ce)
Hydroxyl-bastnäsite-(Nd)	
Ilmorilite	Ilmorilite-(Y)
Ilimaussite	Ilimaussite-(Ce)
Joaquinite	Joaquinite-(Ce)
Kainosite	Kainosite-(Y)
Karnasurtite	Karnasurtite-(Ce)
Keivyite	Keivyite-(Yb)
Kimuraite-(Y)	
Kobeite	Kobeite-(Y)
Kusuite	Kusuite-(Ce)

Original Name	Revised Name
Lanthanite	Lanthanite-(La)
Lanthanite -(Ce)	
Lanthanite-(Nd)	
Laplandite	Laplandite-(Ce)
Lepersonnite	Lepersonnite-(Gd)
Lokkaite	Lokkaite-(Y)
Loparite	Loparite-(Ce)
Loranskite	Loranskite-(Y)
Mckelveyite	Mckelveyite-(Y)
Melanocerite	Melanocerite-(Ce)
Minasgeraisite	Minasgeraisite-(Y)
Monazite	Monazite-(Ce)
Monazite-(La)	
Monazite-(Nd)	
Monteregianite	Monteregianite-(Y)
Moydite	Moydite-(Y)
Neodymium churchite	Churchite-(Nd)
Nioboaeschynite-(Ce)	
Nordite	Nordite-(La)
Nordite-(Ce)	
Okanaganite	Okanoganite-(Y)
Orthojoaquinite	Orthojoaquinite-(Ce)
Parisite	Parisite-(Ce)
Perrierite	Perrierite-(Ce)
Petersite	Petersite-(Y)
Polycrase	Polycrase-(Y)
Retzian	Retzian-(Ce)
Retzian-(La)	
Retzian-(Nd)	
Rhabdophane-(Ce)	
Rhabdophane-(La)	
Rhabdophane	Rhabdophane-(Nd)
Rontgenite	Rontgenite-(Ce)
Rowlandite	Rowlandite-(Y)
Sahamalite	Sahamalite-(Ce)
Samarskite	Samarskite-(Y)
Saryarkite	Saryarkite-(Y)
Sazhinite	Sazhinite-(Ce)
Schuilingite	Schuilingite-(Nd)
Steenstrupine	Steenstrupine-(Ce)
Stillwellite	Stillwellite-(Ce)
Synchysite	Synchysite-(Ce)
Synchysite-(Nd)	
Synchysite-(Y)	
Tadzhikite	Tadzhikite-(Ce)
Tantalaeschynite-(Y)	
Tanteuxenite	Tanteuxenite-(Y)
Tengerite	Tengerite-(Y)
Thalenite	Thalenite-(Y)
Tombarthite	Tombarthite-(Y)
Törnebohmite	Törnebohmite-(Ce)
Törnebohmite	Törnebohmite-(La)
Tritomite	Tritomite-(Ce)
Tritomite-(Y)	
Tundrite	Tundrite-(Ce)
Tundrite-(Nd)	
Tveitite	Tveitite-(Y)
Vitusite	Vitusite-(Ce)
Vyuntspakhkite	Vyuntspakhkite-(Y)
Wakefieldite	Wakefieldite-(Y)
Xenotime	Xenotime-(Y)
Yttrialite	Yttrialite-(Y)
Yttrobetafite	Yttrobetafite-(Y)
Yttrocolumbite	Yttrocolumbite-(Y)
Yttrocrasite	Yttrocrasite-(Y)
Yttropyrochlore	Yttropyrochlore-(Y)
Yttrotantalite	Yttrotantalite-(Y)
Yttrotungstite	Yttrotungstite-(Y)
Zhonghuacerite	Zhonghuacerite-(Ce)