

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

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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 If approval is withheld, the proposal should not be published.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; 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 PROPOSAL

1. 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 proposal should first be submitted to the national committee and subsequently to the CNMMN.

2. Any proposal to redefine or discredit an existing mineral or mineral name, or to revalidate an obsolete name, must be submitted to the vice-chairman of the CNMMN, with a copy to the chairman.

3. If the proposal deals with a mineral group, 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, Netherlands).

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:

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** Chairman, IMA Commission on New Minerals and Mineral Names.

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, color, streak, luster, transparency, hardness, tenacity, cleavage, parting, fracture, density (calculated and measured).

Optical properties. Nonmetallic minerals: optical character (isotropic or anisotropic; uniaxial or biaxial), optical sign, indices of refraction, $2V$, dispersion, orientation, pleochroism, and absorption. Metallic minerals: color 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 checklist should be submitted as part of the proposal. Copies of an official checklist 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

A mineral is a generally accepted as being a crystalline substance that has defined compositional limits and that has been formed as the result of geologic 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 suffi-

ciently 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 owing 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 1. 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 hydroxyl-apatite and by F in fluorapatite.

Example 2. 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 3. 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 accurately. Consequently, a simplified nomenclature is used; first proposed by Ramsdell (1947), it consists of a suffix that is an italicized alphabetical character indicating the crys-

tal system and an italicized numerical symbol indicating the multiplicity of the structural unit. 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 4. Wurtzite-*4H* is a hexagonal polytype with a periodicity of 4 times the *c* dimension of the wurtzite parent; wurtzite-*15R* 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 5. The name aliettite has been given to a 1:1 regular interstratification of talc and trioctahedral smectite.

TYPE SPECIMEN

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 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 that 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 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 one-half ($\frac{1}{2}$) of the members who vote on the proposal have voted "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 nonapproved names or the names of nonapproved minerals is not condoned. Nonapproved minerals for which descriptions have been published should be treated as *unnamed minerals* and fall under the provisions of the preceding paragraph.

REDEFINITION, DISCREDITING, OR REVALIDATION OF MINERALS

Whenever possible, the redefinition or discrediting 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 be 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 of the discrediting or redefinition proposal 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 (1) one that adds or deletes one or more chemical components essential to the definition of the mineral; (2) proposes a new compositional limit to a member of a solid-solution series; or (3) 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. In the examples below, approval is required, except as noted:

Example 6. A case similar to that of johachidolite (*Amer. Mineral.*, 62, 327), in which the elements H, Na, and F were found not to be essential to the mineral.

Example 7. A case similar to that of sarcolite (*Mineral. Mag.*, 48, 107), in which it was shown that F is essential to the mineral.

Example 8. 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 redefinition of the original name and the introduction of three new mineral names for end members.

Example 9. A case similar to that of minerals in the amphibole group, in which compositional limits to members of solid-solution series were proposed (*Amer. Mineral.*, 63, 1023).

Example 10. A case similar to that of pierrotite (*Zeit. Krist.*, 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 11. A case similar to that of onoratoite, originally described as triclinic, but later found to be monoclinic (*Acta Cryst.*, C40, 1506).

Example 12. 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.

Example 13. 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).

A discredited name should not be used in the literature except to report its discrediting. 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, discrediting, or revalidation is analogous to that for the introduction of a new mineral name, and more than a two-thirds (2/3) majority is required to approve such proposals.

A list of mineral names discredited by the CNMMN is given as Appendix Table 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 consensus 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 Table 1, 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 prefix composed of a chemical symbol, 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 that are easily confused; names such as celadonite and calcedonite or mallardite and malladrite can easily be misspelled; names such as rhodesite, rhodizite, and rhodusite are euphonicly very similar. 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., clinoenstatite 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 databases.

The name of a mineral with essential rare-earth elements (or the chemically related elements Y or Sc) must have a suffix indicating the dominant rare-earth element, e.g., bastnäsite-(Ce). 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

TABLE 1. Adjectival modifiers approved by the CNMMN

Ag	argentian	N	nitrian; (NO ₃) ⁻ nitratian
Al	aluminian	NH ₄ ⁺	ammonian
As ³⁺	arsenian; As ⁵⁺ arsenian; (AsO ₃) ³⁻ arsenitian; (AsO ₄) ³⁻ arsenatian	Na	natrian or sodian
Au	aurian	Nb	niobian; (NbO ₄) ³⁻ niobatian
B	borian; (BO ₃) ³⁻ boratoan; (BO ₄) ⁵⁻ boratian	Nd	neodymian
Ba	barian	Ni ²⁺	nickeloan; Ni ³⁺ nickelian
Be	beryllian	O	oxygenian
Bi ³⁺	bismuthian; Bi ⁵⁺ bismuthian; (BiO ₄) ⁵⁻ bismuthatian	Os	osmian
Br	bromian; (BrO ₃) ⁻ bromatian	P	phosphorian; (PO ₄) ³⁻ phosphatian
C	carbonian; (CO ₃) ²⁻ carbonatian	Pb ²⁺	plumboan; Pb ⁴⁺ plumbian
Ca	calcian	Pd ²⁺	palladoan; Pd ⁴⁺ palladian
Cd	cadmian	Pr	praseodymian
Ce ³⁺	ceroan; Ce ⁴⁺ cerian	Pt ²⁺	platinoan; Pt ⁴⁺ platinian
Cl	chlorian; (ClO ₃) ⁻ chloratian	Ra	radian
Co ²⁺	cobaltoan; Co ³⁺ cobaltian	Rb	rubidian
Cr	chromian; (CrO ₄) ²⁻ chromatian	Re	rhenian
Cs	caesian or cesian	Rh	rhodian
Cu ⁺	cuproan; Cu ²⁺ cuprian	Ru	ruthenian
Dy	dysprosian	S	sulphurian or sulfurian; (SO ₄) ²⁻ sulphatian or sulfatian; (SO ₃) ²⁻ sulphitian or sulfitian
Er	erbian	Sb ³⁺	antimonian or stiboan; Sb ⁵⁺ antimonian or stibian; (SbO ₄) ³⁻ antimonatian or stibatian
Eu ²⁺	europoan; Eu ³⁺ europian	Sc	scandian
F	fluorian	Se	selenian; (SeO ₄) ²⁻ selenatian; (SeO ₃) ²⁻ selenitian
Fe ²⁺	ferroan; Fe ³⁺ ferrian	Si	silician; (SiO ₄) ⁴⁻ silicatian
Fr	francian	Sm	samarian
Ga	gallian	Sn ²⁺	stannoan; Sn ⁴⁺ stannian
Gd	gadolinian	Sr	strontian
Ge	germanian; (GeO ₄) ⁴⁻ germanatian	Ta	tantalian
H	hydrogenian; (OH) ⁻ hydroxylian; (H ₃ O) ⁺ hydronian or oxonian; H ₂ O hydrated or hydrous	Tb	terbian
Hf	hafnian	Te	tellurian; (TeO ₄) ²⁻ telluratian; (TeO ₃) ²⁻ telluritian
Hg ⁺	mercurioan; Hg ²⁺ mercurian	Th	thorian
Ho	holmian	Ti ³⁺	titanoan; Ti ⁴⁺ titanian
I	iodian; (IO ₃) ⁻ iodatian	Tl ⁺	thalloan; Tl ³⁺ thallian
In	indian	Tm	thulian
Ir	iridian	U ⁴⁺	uranoan; U ⁶⁺ uranian; (UO ₂) ²⁺ uranylian
K	kalian or potassian	V ²⁺	vanadoan; V ⁵⁺ vanadian; (VO ₄) ³⁻ vanadatian; (VO) ²⁺ vanadylian
La	lanthanian	W	wolframian or tungstenian; (WO ₄) ²⁻ wolframatian or tungstatian
Li	lithian	Y	yttrian
Lu	lutecian	Yb	ytterbian
Mg	magnesian	Zn	zincian
Mn ²⁺	manganian; Mn ³⁺ or Mn ⁴⁺ manganian	Zr	zirconian
Mo	molybdian; (MoO ₄) ²⁻ molybdatian		

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 Table 2.

In a few cases, a procedure similar to that described for minerals with essential rare-earth elements has been used for minerals that 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 where the 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).

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., hydroxylbastnäsite-(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; joe-

smithite, *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 honored.

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.

Reuse 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. Reuse 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 discrediting) for *fifty years*. A proposal to reuse 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 reuse 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 reuse 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, paleontology, 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 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 descriptions of new minerals and discrediting, redefinition, or revalidation of mineral names 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. 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."

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APPENDIX TABLE 1. MINERAL NAMES DISCREDITED BY THE CNMNM (NOT TO BE USED IN PUBLICATIONS) AND APPROVED MINERAL NAME (IF ANY) THAT MAY BE USED IN PUBLICATIONS

Discredited name	Approved name	Reference	Discredited name	Approved name	Reference
Abkhazite	Tremolite	Am. Min. 63 (1978), 1023	Antiglaucophane	Glaucofane or crossite	Am. Min. 63 (1978), 1023
Abriachanite	Riebeckite	Am. Min. 63 (1978), 1023	Arfvedsonite	Arfvedsonite	Am. Min. 63 (1978), 1023
Absite	Brannerite	Am. Min. 48 (1963), 1419	Argentocuproaurite		Min. Mag. 43 (1980), 1055
Abukumalite	Britholite-(Y)	Am. Min. 51 (1966), 152	Arsenate-belovite	Talmessite	this paper
Achrematite	Mixture	Am. Min. 62 (1977), 170	Arsenodialytite		Bull. Min. 97 (1974), 520
Achroinite	Hornblende	Am. Min. 63 (1978), 1023	Asbestos	Asbestos	Am. Min. 63 (1978), 1023
Actinote	Actinolite	Am. Min. 63 (1978), 1023	Asbestinite	Asbestos	Am. Min. 63 (1978), 1023
Actynolite	Actinolite	Am. Min. 63 (1978), 1023	Asbestoide	Asbestos	Am. Min. 63 (1978), 1023
Actynolite	Actinolite	Am. Min. 63 (1978), 1023	Asbestus	Asbestos	Am. Min. 63 (1978), 1023
Adelpholite	Samarskite-(Y)	Am. Min. 51 (1966), 1553	Asharite	Szajbelyite	this paper
Aktinolitischer tachermakite	Magnesio- or ferro-hornblende	Am. Min. 63 (1978), 1023	Ashtonite	Strontian mordenite	Min. Mag. 38 (1971), 383
Alaskaite	Mixture	Am. Min. 58 (1973), 349	Astochite	Manganon richterite	Am. Min. 63 (1978), 1023
Alazanite		Min. Mag. 43 (1980), 1055	Astori(e)	Richterite	Am. Min. 63 (1978), 1023
Albrittonite		Am. Min. 67 (1982), 156	Astrakanite	Blödite	this paper
Alidhanite		Min. Mag. 43 (1980), 1055	Astrolite	Muscovite	Am. Min. 57 (1972), 993
Alkali-ferrohastingsite	Sodian potassian magnesian hastingsite	Am. Min. 63 (1978), 1023	Aurocuprite		Min. Mag. 43 (1980), 1055
Alkali-ferrohastingsite	Sodian potassian hastingsite	Am. Min. 63 (1978), 1023	Azopyrrhite		Am. Min. 62 (1977), 403
Alkali-hastingsite	Sodian potassian hastingsite (hastingsite to magnesian hastingsite)	Am. Min. 63 (1978), 1023	Babubudanite	Magnesio-riebeckite	Am. Min. 63 (1978), 1023
Allcharite	Goethite	Bull. Min. 92 (1969), 99	Badenite	Mixture	Min. Mag. 47 (1983), 411
Allemontite	Stibarsen	Min. Mag. 46 (1982), 513	Balavinskite		Min. Mag. 38 (1971), 103
Allevardite	Rectonite	Am. Min. 49 (1964), 446	Barium		Min. Mag. 38 (1971), 103
Allopalladium	Stibiopalladinite	Am. Min. 63 (1978), 796	Barium phosphosiderite		Am. Min. 63 (1978), 1023
Almosite		this paper	Barkevicite	Ferroan or ferro-pargasitic hornblende	Am. Min. 63 (1978), 1023
Almerite	Natroalunite	Min. Mag. 33 (1962), 353	Barkevikite	Ferroan or ferro-pargasitic hornblende	Am. Min. 63 (1978), 1023
Alpha-catapleite	Gaidonnayite	Can. Min. 16 (1978), 195	Barsanovite	Eucolite	Am. Min. 54 (1969), 1499
Altmakite		Min. Mag. 43 (1980), 1055	Basaltic hornblende	An oxyhornblende, often ferri- or ferrian titanian (magnesian or magnesian hastingsite)	Am. Min. 63 (1978), 1023
Aluminobetafite		Min. Mag. 36 (1967), 133	Basaltine	Oxyhornblende + augite	Am. Min. 63 (1978), 1023
Alumobriholite		Min. Mag. 36 (1967), 133	Basiliite	Hausmannite + feiknechite	Am. Min. 58 (1973), 562
Alumocobaltomelane		Min. Mag. 33 (1962), 261	Bedenite	Ferrian actinolitic hornblende	Am. Min. 63 (1978), 1023
Alumoferroascharite	Mixture	Am. Min. 49 (1964), 1501	Belovite (of Nefedov)	Talmessite	this paper
Ameletite	Nepheline & mixture	Min. Mag. 36 (1968), 438	Bergamaschite	Hastingsite	Am. Min. 63 (1978), 1023
Amiant(h)	Asbestos	Am. Min. 63 (1978), 1023	Bergamaskite	Hastingsite	Am. Min. 63 (1978), 1023
Amianthinite	Asbestos	Am. Min. 63 (1978), 1023	Bergflachs	Asbestos	Am. Min. 63 (1978), 1023
Amianthoide	Asbestos	Am. Min. 63 (1978), 1023	Bergfleisch	Asbestos	Am. Min. 63 (1978), 1023
Amianthus	Asbestos	Am. Min. 63 (1978), 1023	Berghaar	Asbestos	Am. Min. 63 (1978), 1023
Amosite	Asbestiform grunerite or anthophyllite pre 1948	Am. Min. 63 (1978), 1023	Bergkork	Asbestos	Am. Min. 63 (1978), 1023
Ampangabeite	Samarskite-(Y)	Min. Mag. 33 (1962), 262	Bergpapier	Asbestos	Am. Min. 63 (1978), 1023
Amphibole-anthophyllite	Cumingtonite	Am. Min. 63 (1978), 1023	Bergwolle	Asbestos	Am. Min. 63 (1978), 1023
Amphibolite	Hornblende	Am. Min. 63 (1978), 1023	Beryllium sodalite	Tugtupite	Am. Min. 48 (1963), 1178
Analcite	Analcime	Min. Mag. 43 (1980), 1053	Berylliosodalite	Tugtupite	Am. Min. 46 (1961), 241
Anarakite		Min. Mag. 43 (1980), 1055	Beta-alumohydrocalcite		Min. Mag. 36 (1967), 133
Anauxite	Kaolinite	Am. Min. 54 (1969), 206	Beta-broconite		Min. Mag. 43 (1980), 1055
Anophorite	Titanian calcian magnesio-arfvedsonite	Am. Min. 63 (1978), 1023	Beta-lomonosovite		Min. Mag. 36 (1967), 133
Anthogrammatite	Anthophyllite	Am. Min. 63 (1978), 1023	Bialite	Wavellite	Min. Mag. 37 (1969), 123
Anthogrammitite	Anthophyllite	Am. Min. 63 (1978), 1023	Bidolite	Gedrite	Am. Min. 63 (1978), 1023
Antholite	Anthophyllite and cumingtonite	Am. Min. 63 (1978), 1023	Bisbeeite	Chrysocolla	Min. Mag. 43 (1980), 1054
Antholith	Anthophyllite	Am. Min. 63 (1978), 1023	Biteplapalladite	Merenskyite	this paper
Anthophylline	Anthophyllite	Am. Min. 63 (1978), 1023			
Anthophyllite rayonné	Anthophyllite	Am. Min. 63 (1978), 1023			

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APPENDIX TABLE 1. MINERAL NAMES DISCREDITED BY THE CNMNM (NOT TO BE USED IN PUBLICATIONS) AND APPROVED MINERAL NAME (IF ANY) THAT MAY BE USED IN PUBLICATIONS—*Continued*

Discredited name	Approved name	Reference	Discredited name	Approved name	Reference
Benwoodite	Turquoise	Am. Min. 46 (1961), 1520	Kymatite	Asbestos	Am. Min. 63 (1978), 1023
Herrengrundite	Devilline	Min. Mag. 43 (1980), 1053	Labrador hornblende	Orthopyroxene	Am. Min. 63 (1978), 1023
Heterotype	Amphibole + pyroxene	Am. Min. 63 (1978), 1023	Lamprobolite	Oxyhornblende	Am. Min. 63 (1978), 1023
Heubachite	Nickelian heterogenite	Min. Mag. 33 (1962), 253	Lamprostibian	Melanostibian	Am. Min. 53 (1968), 1779
Hexabolit	Oxyhornblende	Am. Min. 63 (1978), 1023	Laneite	Ferroan or ferro-pargasitic hornblende	Am. Min. 63 (1978), 1023
Hexagonite	Manganian tremolite	Am. Min. 63 (1978), 1023	Lavrovite	Chromian diopside	N. Jb. Min., Mh. (1979), 189
Hexastibiopalladite	Sudburyite	Min. Mag. 43 (1980), 1055	Lazarevite	Min. Mag. 33 (1962), 261	
Hillängsäte	Dannemorite	Am. Min. 63 (1978), 1023	Leonhardtite	Starkeyite	Min. Rec. 6 (1975), 144
Hoefelite	Chapmanite	Am. Min. 50 (1965), 2110	Lessarite	Inderite	Min. Mag. 33 (1962), 262
Hopfnerite	Tremolite	Am. Min. 63 (1978), 1023	Lewistonite	Carbonatian fluorapatite	Am. Min. 42 (1978), 282
Hogtveitite	Thalenite-(Y)	Min. Mag. 38 (1971), 102	Linosite	Ferri- or ferrian oxy-kaersutite	Am. Min. 63 (1978), 1023
Holzbasest	Asbestos	Am. Min. 63 (1978), 1023	Lithionglaukophan	Holmquistite	Am. Min. 63 (1978), 1023
Hongquite	this paper	Min. Mag. 33 (1962), 261	Lithium-amphibole	Lithian amphibole, holmquistite and clinro-holmquistite	Am. Min. 63 (1978), 1023
Hornites	Hastingsite	Am. Min. 63 (1978), 1023	Liujinyinite	Uytenbogaardtite	this paper
Hudsonite	Gibbsite	Min. Mag. 43 (1980), 1053	Lodochnikite	Brannerite	Am. Min. 48 (1963), 1419
Hydrargillite	Gibbsite	Min. Mag. 43 (1980), 1053	Lorettoite	Am. Min. 64 (1979), 1303	
Hydroamesite	Gibbsite	Min. Mag. 33 (1962), 261	Macrokaolinite	Min. Mag. 43 (1980), 1055	
Hydrocalcite	Gibbsite	Min. Mag. 43 (1980), 1055	Magnanthophyllite	Magnesian-anthophyllite	Am. Min. 63 (1978), 1023
(of Marschner)	Mixture	Min. Mag. 33 (1962), 262	Magnesia-arfvedsonite	Magnesian-anthophyllite	Am. Min. 63 (1978), 1023
Hydrocaastorite	Hydrocaaptleite	Min. Mag. 36 (1967), 133	Magnesian glaucophane	Glaucophane	Am. Min. 63 (1978), 1023
Hydrocaaptleite	Hydroceerite	Min. Mag. 33 (1962), 261	Magnesian olauumontite	Magnesian-anthophyllite	Am. Min. 63 (1978), 1023
Hydrochlore	Pyrochlore	Am. Min. 62 (1977), 403	Magnesium anthophyllite	Magnesian-anthophyllite	Am. Min. 63 (1978), 1023
Hydrocyanite	Chalcocyanite	this paper	Magnesium szomolnokite	Jacobsite	Am. Min. 58 (1973), 562
Hydrohalloysite	Min. Mag. 36 (1967), 133	Magnesium actinolite	Suanite	Am. Min. 48 (1963), 915	
Hydrokaasite	Min. Mag. 36 (1968), 1144	Magnesian vermiculite	Titanian potassian richterite	Min. Mag. 36 (1968), 1144	
Hydromylsate	Min. Mag. 36 (1968), 1144	Magnesian vermiculite	Rhodonite	Am. Min. 63 (1978), 1023	
Hydronaujakasite	Min. Mag. 38 (1971), 103	Magnesian vermiculite	Manganandalusite	this paper	
Hydropyrochlore	Altered pyrochlore	Am. Min. 62 (1977), 403	Mangan crocidolite	Manganian riebeckite	Am. Min. 63 (1978), 1023
Hydrozinkite	Min. Mag. 43 (1980), 1055	Magnesian vermiculite	Mangan crocidolith	Manganian riebeckite	Am. Min. 63 (1978), 1023
Hydrosericite	Min. Mag. 36 (1968), 1144	Magnesian vermiculite	Mangan-actinolite	Manganian actinolite	Am. Min. 63 (1978), 1023
Hydrosoedinite	Min. Mag. 33 (1962), 261	Magnesian vermiculite	Mangan-tremolite	Manganian tremolite	Am. Min. 63 (1978), 1023
Hydrozirconite	Min. Mag. 36 (1967), 133	Magnesian vermiculite	Mangan-anthophyllite	Tirodite	Am. Min. 63 (1978), 1023
Hydroxyl-ascharite	Min. Mag. 36 (1968), 1144	Magnesian vermiculite	Manganomelane	Psilomelane	Min. Mag. 46 (1982), 513
Hydroxyl-szabelyite	Min. Mag. 36 (1968), 1144	Magnesian vermiculite	Manganomossite	Manganocolumbite	Min. Mag. 33 (1962), 262
Idocrase	Vesuvianite	this paper	Manganosteenstrupine	Manganotapiolite	Am. Min. 70 (1985), 217
Igalikite	Min. Mag. 33 (1962), 262	Manganosteenstrupine	Manganotapiolite	Manganian magnesio-arfvedsonite	Am. Min. 63 (1978), 1023
Igdloite	Lueshite	Min. Mag. 33 (1962), 261	Manganotapiolite	Manganian magnesio-arfvedsonite	Am. Min. 63 (1978), 1023
Imerinite	Magnesio-arfvedsonite	Am. Min. 63 (1978), 1023	Manganuralite	Cerriopyrochlore-(Ce)	Am. Min. 62 (1977), 403
Imgreite	Min. Mag. 36 (1967), 133	Manganuralite	Manganian richterite	Am. Min. 63 (1978), 1023	
Iodyrite	Min. Mag. 43 (1980), 1055	Manganuralite	Matorolite	Min. Mag. 38 (1971), 103	
Iron-anthophyllite	Ferro-anthophyllite	Am. Min. 63 (1978), 1023	Mozziite	Potassian taramite	Am. Min. 63 (1978), 1023
Iron-hornblende	Oxy-manganian potassian ferrian ferro-hornblende	Am. Min. 63 (1978), 1023	Marmarolite	Chrysocolla + mica	Am. Min. 54 (1969), 994
Iron-richterite	Ferro-richterite	Am. Min. 63 (1978), 1023	Matorolite	Tenorite	Min. Mag. 43 (1980), 1053
Isabellite	Richterite	Am. Min. 63 (1978), 1023	Mozziite	Greigite	Min. Mag. 46 (1982), 513
Ishiganeite	Cryptomelane	Am. Min. 49 (1964), 448	Mozziite	Betafite	Am. Min. 62 (1977), 403
Isoplatinocopper	Min. Mag. 43 (1980), 1055	Mozziite	Betafite	Betafite	Am. Min. 62 (1977), 403
Isowolframate	Min. Mag. 43 (1980), 1055	Mozziite	Betafite	Betafite	Am. Min. 62 (1977), 403
Jenkinsite	Ferroan antigorite	Am. Min. 47 (1962), 783	Mozziite	Betafite	Am. Min. 62 (1977), 403
Ježekite	Min. Mag. 47 (1962), 398	Mozziite	Betafite	Betafite	Am. Min. 62 (1977), 403
Jiningite	Min. Mag. 33 (1962), 261	Mozziite	Betafite	Betafite	Am. Min. 62 (1977), 403
Johnstonite	Spessartine	Am. Min. 53 (1968), 1065	Mozziite	Betafite	Am. Min. 62 (1977), 403
Juddite	Manganian magnesio-arfvedsonite	Am. Min. 63 (1978), 1023	Mozziite	Betafite	Am. Min. 62 (1977), 403
Julgoidite	Julgoidite-(Fe ²⁺)	Can. Min. 12 (1973), 219	Mozziite	Betafite	Am. Min. 62 (1977), 403
Kalamite	Tremolite	Am. Min. 63 (1978), 1023	Mozziite	Betafite	Am. Min. 62 (1977), 403
Kalio-magnesio-richterite	Titanian potassian richterite	Am. Min. 63 (1978), 1023	Mozziite	Betafite	Am. Min. 62 (1977), 403
Kamarevite	Brochantite	Am. Min. 50 (1965), 1450	Mozziite	Betafite	Am. Min. 62 (1977), 403
Kanegakite	Min. Mag. 46 (1962), 514	Mozziite	Betafite	Betafite	Am. Min. 62 (1977), 403
Karintin	Hornblende, often pargasitic hornblende	Am. Min. 63 (1978), 1023	Mozziite	Betafite	Am. Min. 62 (1977), 403
Karpinskyite	Mixture	Am. Min. 57 (1972), 1006	Mozziite	Betafite	Am. Min. 62 (1977), 403
Khlopinite	Samarskite-(Y)	Am. Min. 57 (1972), 329	Mozziite	Betafite	Am. Min. 62 (1977), 403
Khuniite	Iranite	Am. Min. 61 (1976), 186	Mozziite	Betafite	Am. Min. 62 (1977), 403
Kidney stone	Actinolite	Am. Min. 63 (1978), 1023	Mozziite	Betafite	Am. Min. 62 (1977), 403
Kievite	Cumingtonite	Am. Min. 63 (1978), 1023	Mozziite	Betafite	Am. Min. 62 (1977), 403
Killinite	Hydromuscovite	Min. Mag. 48 (1984), 566	Mozziite	Betafite	Am. Min. 62 (1977), 403
Kirwanite	Impure altered hornblende	Am. Min. 63 (1978), 1023	Mozziite	Betafite	Am. Min. 62 (1977), 403
Kivuite	Min. Mag. 33 (1962), 261	Mozziite	Betafite	Betafite	Am. Min. 62 (1977), 403
Kleberite	this paper	Min. Mag. 33 (1962), 261	Mozziite	Betafite	Am. Min. 62 (1977), 403
Klipsteinite	Neotocite	Min. Mag. 42 (1978), 279	Mozziite	Betafite	Am. Min. 62 (1977), 403
Knaite	Min. Mag. 36 (1967), 133	Mozziite	Betafite	Betafite	Am. Min. 62 (1977), 403
Kripovichite	Alumohydrocalcite	Am. Min. 61 (1976), 341	Mozziite	Betafite	Am. Min. 62 (1977), 403
Kokscharovite	Ebénitic amphibole	Am. Min. 63 (1978), 1023	Mozziite	Betafite	Am. Min. 62 (1977), 403
Kokscharovite	Ebénitic amphibole	Am. Min. 63 (1978), 1023	Mozziite	Betafite	Am. Min. 62 (1977), 403
Kolskite	Lizardite + sepiolite	Am. Min. 59 (1974), 212	Mozziite	Betafite	Am. Min. 62 (1977), 403
Koppeite	Pyrochlore	Am. Min. 62 (1977), 403	Mozziite	Betafite	Am. Min. 62 (1977), 403
Kozhanovite	Karnaasurite	Min. Mag. 33 (1962), 262	Mozziite	Betafite	Am. Min. 62 (1977), 403
Krocidolite	Crocidolite	Am. Min. 63 (1978), 1023	Mozziite	Betafite	Am. Min. 62 (1977), 403
Krokydolite	Crocidolite	Am. Min. 63 (1978), 1023	Mozziite	Betafite	Am. Min. 62 (1977), 403
Kupfferite	Magnesian-anthophyllite	Am. Min. 63 (1978), 1023	Mozziite	Betafite	Am. Min. 62 (1977), 403
(Allen & Clement)	Chromian anthophyllite	Am. Min. 63 (1978), 1023	Mozziite	Betafite	Am. Min. 62 (1977), 403
Kupfferite (Hermann)	Chromian anthophyllite	Am. Min. 63 (1978), 1023	Mozziite	Betafite	Am. Min. 62 (1977), 403
Kupfferite (Koksharov)	Chromian anthophyllite	Am. Min. 63 (1978), 1023	Mozziite	Betafite	Am. Min. 62 (1977), 403
Kurgantaite	Strontian tyretskite + celestine	Min. Mag. 46 (1982), 514	Mozziite	Betafite	Am. Min. 62 (1977), 403
Kusuite	Wakefieldite-(Ce)	Bull. Min. 109 (1986), 30	Mozziite	Betafite	Am. Min. 62 (1977), 403
Kyanophyllite	Paragonite + muscovite	Am. Min. 58 (1973), 807	Mozziite	Betafite	Am. Min. 62 (1977), 403

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APPENDIX TABLE 1. MINERAL NAMES DISCREDITED BY THE CNMNM (NOT TO BE USED IN PUBLICATIONS) AND APPROVED MINERAL NAME (IF ANY) THAT MAY BE USED IN PUBLICATIONS—*Continued*

Discredited name	Approved name	Reference	Discredited name	Approved name	Reference
Niobpyrochlore	Pyrochlore	Am. Min. 62 (1977), 403	Rutherfordite	Rutherfordine	Min. Mag. 43 (1980), 1053
Niobantalpyrochlore	Pyrochlore/microlite	Am. Min. 62 (1977), 403	Salmonsite	Hureaulite + jahnsite	Min. Mag. 42 (1978), 309
Nitroglauoberite	Darapskite	Am. Min. 55 (1970), 776	Samiresite	Plumbian uranpyrochlore	Am. Min. 62 (1977), 403
Noonkanbahite		Min. Mag. 36 (1968), 1144	Sangarite	Phoenicochroite	Min. Mag. 36 (1967), 133
Noralite	Ferro-hornblende	Am. Min. 63 (1978), 1023	Scheibite (of Mücke)		Am. Min. 56 (1971), 359,
Nordenskiöldite	Tremolite	Am. Min. 63 (1978), 1023	Schettelgite		Am. Min. 62 (1977), 403
Nuolaita	Mixture	Am. Min. 62 (1977), 403	Schneiderite	Schmiederite	Min. Mag. 43 (1980), 1054
Obruchevite	Ytropyrochlore	Am. Min. 62 (1977), 403	Schnoente	Picromerite	this paper
Octahedrite	Anatase	Min. Mag. 43 (1980), 1053	Schnönte	Picromerite	this paper
Oligiste	Hematite	Min. Mag. 43 (1980), 1053	Schuchardtite	Vermiculite-chlorite	Am. Min. 64 (1979), 1334
Olovotantalite		Min. Mag. 36 (1967), 133	Schulzenite	Cuprian heterogenite	Min. Mag. 33 (1962), 253
Ondrejite	Huntite + magnesite	Am. Min. 49 (1964), 1502	Sebesite	Tremolite	Am. Min. 63 (1978), 1023
Opimose	Neotocite	Min. Mag. 42 (1978), 279	Selenjoseite	Laitakarite	Am. Min. 498 (1963), 1421
Orizite	Epistilbite	Am. Min. 57 (1972), 592	Septetalc-chlorite	Baumite	Am. Min. 61 (1976), 174
Orniblende	Hornblende	Am. Min. 63 (1978), 1023	Shachalite	this paper	
Orthite	Allanite	this paper	Shentulite	Actinolite	Min. Mag. 33 (1962), 261
Ortho-armalcolite		Min. Mag. 43 (1980), 1055	Silbölite	Dannemorite	Am. Min. 63 (1978), 1023
Ortholomonosovite	Lomonosovite	Am. Min. 48 (1963), 1413	Silfbergite	Mixture	Am. Min. 62 (1977), 403
Orthorhombic lamprophyllite		Min. Mag. 36 (1968), 1144	Silicate-wiikite		Am. Min. 62 (1977), 403
Orthorhombic lävenite		Min. Mag. 36 (1968), 1144	Silicomanganberzeliite		Min. Mag. 36 (1968), 1144
Orthoriebeckite	Riebeckite	Am. Min. 63 (1978), 1023	Silicomazonite		Min. Mag. 43 (1980), 1055
Orthose	Orthoclase	Min. Mag. 43 (1980), 1053	Silicochabodophane		Min. Mag. 36 (1967), 133
Orthozoisite		Min. Mag. 38 (1971), 103	Sillbösite	Actinolite	Am. Min. 63 (1978), 1023
Oryzite	Epistilbite	Am. Min. 57 (1972), 592	Simpsonite	Titanian potassian richterite	Am. Min. 63 (1978), 1023
Osannite	Riebeckite	Am. Min. 63 (1978), 1023	Sjögrufvite	Caryinite	Am. Min. 58 (1973), 562
Osumilite-(K,Mg)		Min. Mag. 43 (1980), 1055	Slavanskite	Tunisite	Z.V.M.C. 110 (1981), 96
Oxyferropumpellyite	Pumpellyite-(Fe ₃)	Can. Min. 12 (1973), 219	Smaragditic	Actinolite or hornblende	Am. Min. 63 (1978), 1023
Oxyjulgoldite	Julgoldite-(Fe ³⁺)	Can. Min. 12 (1973), 219	Smaragditic grammatite	Tremolite	Am. Min. 63 (1978), 1023
Palladiumarsenostannide	this paper		Smaragditic tschermakite	Tschermakite or tschermakitic hornblende	Am. Min. 63 (1978), 1023
Panabase	Tetrahedrite	Min. Mag. 43 (1980), 1053	Sobotkite	Saponite	this paper
Pandaite	Bariopyrochlore	Am. Min. 62 (1977), 403	Soda	Natron	Min. Mag. 43 (1980), 1053
Para-armalcolite		Min. Mag. 43 (1980), 1055	Soda asbestos	Magnesio-arfvedsonite	Am. Min. 63 (1978), 1023
Para-boleite		Min. Mag. 43 (1980), 1055	Soda hornblende	Arfvedsonite	Am. Min. 63 (1978), 1023
Parahilgardite	Hilgardite-37c	Am. Min. 70 (1985), 636	Soda niter	Nitratine	Am. Min. 63 (1980), 1053
Parapectolite		Min. Mag. 43 (1980), 1055	Soda nitre	Nitratine	Min. Mag. 43 (1980), 1053
Paraphane		Min. Mag. 36 (1968), 1144	Soda richterite	Manganooan richterite	Am. Min. 63 (1978), 1023
Parastrengite		Min. Mag. 43 (1980), 1055	Soda tremolite	Richterite	Am. Min. 63 (1978), 1023
Paravariscite		Min. Mag. 43 (1980), 1055	Sodium phlogopite	this paper	
Parawollastonite		Min. Mag. 33 (1962), 261	Sokolovite	Magnesian hastingsite	Min. Mag. 33 (1962), 261
Paulite		Am. Min. 54 (1969), 329	Soretite	Tritomite-(Y)	Am. Min. 63 (1978), 1023
Pendletonite	Carpathite	Min. Mag. 42 (1978), 279	Spencite	Spessartine	Am. Min. 51 (1966), 152
Penwithite	Neotocite	Min. Mag. 43 (1980), 1055	Spessartite	Hornblende	Am. Min. 63 (1978), 1023
Pharaonite	Davyne	Am. Min. 63 (1978), 1023	Speziatite	Sphaerocobaltite	Min. Mag. 43 (1980), 1053
Philipsbadite	Ferrian ferro-hornblende	Am. Min. 63 (1978), 1023	Sphaerocobaltite	Titanite	Min. Mag. 46 (1982), 513
Phosphochromite	Ferrian variscite	Am. Min. 48 (1963), 1421	Spñene		Min. Mag. 36 (1967), 133
Phosphothorogummite		Min. Mag. 38 (1971), 103	Stannulazonite	Kolbeckite	this paper
Pianlinite	this paper		Sterretite		Min. Mag. 38 (1971), 103
Picroamosite	Ferrian anthophyllite	Am. Min. 63 (1978), 1023	Stibicudrenoyisite	Mixture	Am. Min. 62 (1977), 403
Piedmontite	Piemontite	Min. Mag. 43 (1980), 1053	Stibiomicrocline	Antimonpearceite	this paper
Pilinite	Bavenite	Min. Mag. 33 (1962), 262	Stibiopearceite		Min. Mag. 36 (1967), 133
Pillite	Actinolite pseudomorph	Am. Min. 63 (1978), 1023	Stipoverite	Actinolite	Am. Min. 63 (1978), 1023
Pleonectite	Hedyphane	Am. Min. 58 (1973), 562	Strahlstein	Neotocite	Min. Mag. 42 (1978), 279
Pleurasite	Mixture	Am. Min. 58 (1973), 562	Stratopeite	Actinolite or anthophyllite	Am. Min. 63 (1978), 1023
Plinthite	Mixture	Min. Mag. 33 (1962), 262	Strelite	Strontian tyretskite	Min. Mag. 46 (1982), 514
Plumalite		Min. Mag. 38 (1971), 103	Strontiohilgardite		Min. Mag. 33 (1962), 261
Plumangite		Min. Mag. 43 (1980), 1055	Strontiohilgardite-17a		Min. Mag. 36 (1968), 1144
Plumboallopahane		Min. Mag. 43 (1980), 1055	Strontium thomsonite	Crossite	Am. Min. 63 (1978), 1023
Plumbozincoalcite		Min. Mag. 38 (1971), 103	Subglaucofane	Stannomicrocline	Am. Min. 62 (1977), 403
Polianite	Pyrolusite	Min. Mag. 46 (1982), 513	Sulphate-monazite		Min. Mag. 36 (1967), 133
Polyxene		Can. Min. 13 (1975), 117	Sulunite		Min. Mag. 33 (1962), 261
Pravdite	Altered britholite	Am. Min. 49 (1964), 1501	Sundiusite	Lizardite + sepiolite	Am. Min. 59 (1974), 212
Priorite	Aeschynite-(Y)	Am. Min. 51 (1966), 152	Sungulite	Oxy magnesio-riebeckite	Am. Min. 63 (1978), 1023
Prismatic schillerspar	Anthophyllite	Am. Min. 63 (1978), 1023	Svidneite	Celadonite	Am. Min. 63 (1978), 796
Proarizonite		Min. Mag. 36 (1967), 133	Svitalskite	Titanian hastingsite	Am. Min. 63 (1978), 1023
Protopartzite		Min. Mag. 38 (1971), 103	Syntagmatite (Troger, 1952)		
Pseudo-aenigmatite		Min. Mag. 36 (1968), 1144	Szechenyite	Richterite	Am. Min. 63 (1978), 1023
Pseudautunite		Min. Mag. 36 (1968), 1144	Szechonyit	Richterite	Am. Min. 63 (1978), 1023
Pseudoglaucophane	Glaucophane or crossite	Am. Min. 63 (1978), 1023	Taaffeite-9H	Musgravite	Am. Min. 69 (1984), 215
Pseudioxiolite	Ixiolite	Can. Min. 14 (1976), 540	Taiyite	Aeschynite-(Y)	Min. Mag. 43 (1980), 1055
Pseudomesolite	Mesolite	Min. Mag. 49 (1985), 103	Tangaite	Redondite	Am. Min. 49 (1964), 445
Pseudonatrolite	Mordenite	Min. Mag. 33 (1962), 262	Tangenite		Am. Min. 62 (1977), 403
Psilomelane	Romanchite	Min. Mag. 46 (1982), 513	Tantalbetafite	Betafite	Am. Min. 62 (1977), 403
Pumpellyite	Pumpellyite-(Mg)	Can. Min. 12 (1973), 219	Tantalchattetolite	Uranmicrocline	Am. Min. 62 (1977), 403
Pyrochlore-microlite	Pyrochlore or microlite	Am. Min. 62 (1977), 403	Tantalo-obruchevite		Am. Min. 62 (1979), 403
Pyrochlore-wiikite	Mixture	Am. Min. 62 (1977), 403	Tantalpyrochlore	Microlite	Am. Min. 62 (1977), 403
Pyrrhite		Am. Min. 62 (1977), 403	Tantalum		Am. Min. 47 (1962), 786
Pyrrhoarsenite	Berzeliite	Am. Min. 58 (1973), 562	Tanzanite		Min. Mag. 43 (1980), 1055
Raphilite	Tremolite	Am. Min. 63 (1978), 1023	Taprobanite	Taaffeite	Min. Mag. 46 (1982), 514
Raphisiderite	Hematite	Am. Min. 53 (1968), 1060	Tarasovite		Am. Min. 67 (1982), 394
Retinostibian		Bull. Min. 97 (1974), 520	Tatarkalite	Ripidolite	Am. Min. 50 (1965), 2111
Revoredite		Min. Mag. 33 (1962), 262	Tatavistokite	Apatite	Min. Mag. 37 (1969), 123
Rezhikite	Magnesio-riebeckite or magnesio-arfvedsonite	Min. Mag. 33 (1962), 261	Taylorite	Ammonian arcanite	Can. Min. 23 (1985), 259
Rhenium	this paper		Ternokovite		Min. Mag. 38 (1971), 103
Rhodarsenian	Rhodonite	Am. Min. 58 (1973), 562	Ternovskite	Magnesio-riebeckite	Am. Min. 63 (1978), 1023
Rhodusite	Magnesio-riebeckite	Am. Min. 63 (1978), 1023	Tetrakalsilite	Panunzite	N.Jb.Min.Wh. (1985), 87,
Rhombomagnojacobsite		Min. Mag. 36 (1967), 133	Texasite		Am. Min. 67 (1982), 156
Rijkboerite	Bariomicrocline	Am. Min. 62 (1977), 403	Thalackerite	Anthophyllite	Am. Min. 63 (1978), 1023
Rimplyite	Hornblende	Am. Min. 63 (1978), 1023	Thierschite	Whewellite	Am. Min. 47 (1962), 786
Rogersite	Churchite	Am. Min. 48 (1963), 1168			
Roseite		Min. Mag. 38 (1971), 103			
Royite	Alpha-quartz	Am. Min. 47 (1962), 1223			

APPENDIX TABLE 1. MINERAL NAMES DISCREDITED BY THE CNMNM (NOT TO BE USED IN PUBLICATIONS) AND APPROVED MINERAL NAME (IF ANY) THAT MAY BE USED IN PUBLICATIONS—*Continued*

Discredited name	Approved name	Reference	Discredited name	Approved name	Reference
Thorogadolinite		Min. Mag. 43 (1980), 1055	Vanuranylite		Min. Mag. 36 (1968), 1144
Thoroaeschynite		Min. Mag. 36 (1968), 1144	Veikite		Min. Mag. 43 (1980), 1055
Tibergite	Manganoo sodian magneso-hastingsite	Am. Min. 63 (1978), 1023	Vernadskite	Antlerite	Am. Min. 46 (1961), 146
Tin-tantalite		Min. Mag. 36 (1967), 133	Viridine	Manganoo andalusite	Zts. Krist. 155 (1981), 8
Titanbetafite	Betafite	Am. Min. 62 (1977), 403	Waldheimite	Richterite	Am. Min. 63 (1978), 1023
Titanhornblende	Aenigmatite	Am. Min. 63 (1978), 1023	Wallerian	Hornblende	Am. Min. 63 (1978), 1023
Titanmicrolite		Am. Min. 62 (1977), 403	Warthaite	Cosalite + galena	Am. Min. 49 (1964), 1501
Titano-aeschynite		Min. Mag. 36 (1967), 133	Wathlingite	Kieserite	Am. Min. 47 (1962), 811
Titano-obruchevite	Yttrobetafite-(Y)	Am. Min. 62 (1977), 403	Wehrlite	Mixture	Am. Min. 69 (1984), 215
Titanopyrochlore	Mixture	Am. Min. 62 (1977), 403	Weibeyite	Bastnäsite + ancylite	Am. Min. 49 (1964), 1154
Titanorhabdophane		Min. Mag. 36 (1967), 133	Weilerite		Min. Mag. 36 (1967), 133
Tockite	Columbite + samarskite	Am. Min. 47 (1962), 1363	Weinschenkite	Churchite-(Y)	Min. Mag. 46 (1982), 513
Tonerdehaltiger strahlstein	Tremolite	Am. Min. 63 (1978), 1023	Weinschenkite (of Laubman)		
Torendrikite	Magneso-riebeckite	Am. Min. 63 (1978), 1023	Weinschenkite (of Murgoci)	Ferri-magneso- hornblende or magneso-hastingsite	Am. Min. 63 (1978), 1023
Tozalite		Min. Mag. 43 (1980), 1055	Westgrenite	Bismutomicrolite	Am. Min. 62 (1977), 403
Transvaalite	Heterogenite	Min. Mag. 33 (1962), 253	Wiikite	Mixture	Am. Min. 62 (1977), 403
Tremolite-glaucophane	Richterite	Am. Min. 63 (1978), 1023	Wilkeite	Apatite/fluorellestadite	Min. Mag. 46 (1982), 514
Triphane	Spodumene	Min. Mag. 43 (1980), 1053	Wittingite	Neotocite	Min. Mag. 42 (1978), 279
Trudellite	Natroalunite + chloraluminite	Am. Min. 57 (1972), 1317	Wolfraoixiolite		Min. Mag. 43 (1980), 1055
Tsavalite	Grossular	this paper	Woodfordite	Ettringite	Min. Mag. 33 (1962), 262
Tschernischewit	Sodium amphibole	Am. Min. 63 (1978), 1023	Yamatoite		Min. Mag. 36 (1967), 133
Tucanite		Min. Mag. 36 (1968), 1144	Yanzhongite	Kotulskite	Min. Mag. 43 (1980), 1055
Turite		Min. Mag. 36 (1968), 1144	Yenshanite	Vysotskite	Min. Mag. 43 (1980), 1055
Tynite		Min. Mag. 36 (1967), 133	Yftsite		this paper
Tyretskite	Tyretskite- <i>Itc</i>	Am. Min. 70 (1985), 636	Yokosukaite	Nautite	Am. Min. 49 (1964), 448
Udokanite		Min. Mag. 43 (1980), 1055	Yttromicrolite	Ytropyrochlore-(Y)	Am. Min. 62 (1977), 403
Udumnelite		Min. Mag. 39 (1974), 929	Zeiringite		Am. Min. 67 (1982), 156
Ufertite	Davidite-(La)	Am. Min. 49 (1964), 447	Zeyringite	Aragonite + aurichalcite	Am. Min. 48 (1963), 1184
Ugite	Thomsonite + gyrolite	Min. Mag. 33 (1962), 262	Zillerite	Aragonite + aurichalcite	Am. Min. 48 (1963), 1184
Uralite	Actinolite pseudomorph	Am. Min. 63 (1978), 1023	Zillerthite	Actinolite	Am. Min. 63 (1978), 1023
Uranglimmer	Uranite	Min. Mag. 43 (1980), 1053	Zinc-manganeso- cummingtonite	Actinolite	Am. Min. 63 (1978), 1023
Uranmica	Uranite	Min. Mag. 43 (1980), 1053	Zinc tirodite		Am. Min. 63 (1978), 1023
Uranoanatase		Min. Mag. 36 (1968), 1144	Zincalunite		Min. Mag. 36 (1967), 133
Oreyite	Kosmochlor	this paper	Zincblende	Sphalerite	Min. Mag. 43 (1980), 1053
Uzbekite	Volborthite	Am. Min. 50 (1965), 2111	Zirconolite	Zirkelite	Am. Min. 62 (1977), 403
Vallachite		Min. Mag. 38 (1971), 103	Zirlite	Gibbsite	Am. Min. 47 (1962), 1223
Valleite	Calcian manganoo anthophyllite	Am. Min. 63 (1978), 1023	Zirsite		Min. Mag. 36 (1967), 133

APPENDIX TABLE 2. Revised nomenclature for rare-earth-element minerals

Original Name	Revised Name	Original Name	Revised Name
Aeschnite	Aeschnite-(Ce)	Lanthanite -(Ce)	
Aeschnite-(Nd)		Lanthanite-(Nd)	
Agardite	Agardite-(Y)	Laplandite	Laplandite-(Ce)
Agardite-(La)		Lepersonnite	Lepersonnite-(Gd)
Allanite	Allanite-(Ce)	Lokkaiite	Lokkaiite-(Y)
Allanite-(Y)	Allanite-(La)	Loparite	Loparite-(Ce)
Ancylite	Ancylite-(Ce)	Loranskite	Loranskite-(Y)
Ashcroftine	Ashcroftine-(Y)	Mckelveyite	Mckelveyite-(Y)
Bastnäs site	Bastnäs site-(Ce)	Melanocerite	Melanocerite-(Ce)
Bastnäs site-(La)		Minasgeraisite	Minasgeraisite-(Y)
Bastnäs site-(Y)		Monazite	Monazite-(Ce)
Bijvoetite	Bijvoetite-(Y)	Monazite-(La)	
Braitschite	Braitschite-(Ce)	Monazite-(Nd)	
Britholite	Britholite-(Ce)	Monteregianite	Monteregianite-(Y)
Britholite-(Y)		Moydite	Moydite-(Y)
Calcioancylite	Calcioancylite-(Ce)	Neodymium churchite	Churchite-(Nd)
Calkinsite	Calkinsite-(Ce)	Nioboaeschnite-(Ce)	
Cappelenite	Cappelenite-(Y)	Nordite	Nordite-(La)
Caysichite	Caysichite-(Y)	Nordite-(Ce)	
Cebaite	Cebaite-(Ce)	Okanaganite	Okanaganite-(Y)
Cerianite	Cerianite-(Ce)	Orthojoaquinite	Orthojoaquinite-(Ce)
Cerriopyrochlore	Cerriopyrochlore-(Ce)	Parisite	Parisite-(Ce)
Cerite	Cerite-(Ce)	Perrierite	Perrierite-(Ce)
Cerrotungstite	Ytrotungstite-(Ce)	Petersite	Petersite-(Y)
Chernovite	Chernovite-(Y)	Polycrase	Polycrase-(Y)
Chevkinite	Chevkinite-(Ce)	Retzian	Retzian-(Ce)
Chukhrovite	Chukhrovite-(Y)	Retzian-(La)	
Chukhrovite-(Ce)		Retzian-(Nd)	
Churchite	Churchite-(Y)	Rhabdophane-(Ce)	
Cordylite	Cordylite-(Ce)	Rhabdophane-(La)	
Daqingshanite	Daqingshanite-(Ce)	Rhabdophane	Rhabdophane-(Nd)
Davidite	Davidite-(Ce)	Röntgenite	Röntgenite-(Ce)
Davidite-(Y)	Davidite-(Y)	Rowlandite	Rowlandite-(Y)
Davidite-(La)	Davidite-(La)	Sahamalite	Sahamalite-(Ce)
Donnayite	Donnayite-(Y)	Samarskite	Samarskite-(Y)
Euxenite	Euxenite-(Y)	Saryarkite	Saryarkite-(Y)
Ewaldite	Ewaldite-(Y)	Sazhinite	Sazhinite-(Ce)
Fergusonite	Fergusonite-(Y)	Schuilingite	Schuilingite-(Nd)
Fergusonite-beta	Fergusonite-beta-(Y)	Steenstrupine	Steenstrupine-(Ce)
Fergusonite-beta-(Ce)		Stillwellite	Stillwellite-(Ce)
Fergusonite-beta-(Nd)		Synchysite	Synchysite-(Ce)
Florencite	Florencite-(Ce)	Synchysite-(Nd)	
Florencite-(La)		Synchysite-(Y)	
Florencite-(Nd)		Tadzhikite	Tadzhikite-(Ce)
Fluocerite	Fluocerite-(Ce)	Tantalaeschnite-(Y)	
Fluocerite-(La)		Tanteuxenite	Tanteuxenite-(Y)
Formanite	Formanite-(Y)	Tengerite	Tengerite-(Y)
Gadolinite	Gadolinite-(Y)	Thalenite	Thalenite-(Y)
Gadolinite-(Ce)		Tombarthite	Tombarthite-(Y)
Gagarinite	Gagarinite-(Y)	Törnebohmite	Törnebohmite-(Ce)
Gysinite	Gysinite-(Nd)	Törnebohmite	Törnebohmite-(La)
Hellandite	Hellandite-(Y)	Tritomite	Tritomite-(Ce)
Hingganite	Hingganite-(Y)	Tritomite-(Y)	
Hingganite-(Yb)		Tundrite	Tundrite-(Ce)
Huanghoite	Huanghoite-(Ce)	Tundrite-(Nd)	
Hydroxyl-bastnäs site	Hydroxyl-bastnäs site-(Ce)	Tveitite	Tveitite-(Y)
Hydroxyl-bastnäs site-(Nd)		Vitusite	Vitusite-(Ce)
Iimoriite	Iimoriite-(Y)	Vyuntspakhkite	Vyuntspakhkite-(Y)
Ilimaussite	Ilimaussite-(Ce)	Wakefieldite	Wakefieldite-(Y)
Joaquinite	Joaquinite-(Ce)	Xenotime	Xenotime-(Y)
Kainosite	Kainosite-(Y)	Yttrialite	Yttrialite-(Y)
Karnasurtite	Karnasurtite-(Ce)	Yttrobetafite	Yttrobetafite-(Y)
Keivyite	Keivyite-(Yb)	Yttrocolumbite	Yttrocolumbite-(Y)
Kimuraite-(Y)		Yttrocrasite	Yttrocrasite-(Y)
Kobeite	Kobeite-(Y)	Yttropyrochlore	Yttropyrochlore-(Y)
Kusuïte	Kusuïte-(Ce)	Yttrotantalite	Yttrotantalite-(Y)
Lanthanite	Lanthanite-(La)	Yttrotungstite	Yttrotungstite-(Y)
		Zhonghuacerite	Zhonghuacerite-(Ce)