

## SUGGESTED OUTLINE FOR NEW MINERAL DESCRIPTIONS

The Commission on New Minerals and Mineral Names of the  
International Mineralogical Association

This "suggested outline" is largely based on a previous paper with the same title by Donnay & Fleischer (1970).

All manuscripts that describe new minerals and new synthetic crystalline phases have a good deal in common. Nearly all the leading mineralogical journals now require that proposals of new mineral names be approved in advance by the I.M.A. Commission on New Minerals and Mineral Names. To save both authors' and referees' time and trouble, we are listing below the subtitles followed by brief descriptions that authors should attempt to deal with whenever possible. It is evident that not all the data suggested can be obtained, especially on small samples, but enough data must be provided to characterize the mineral unambiguously. As a rule, this will require as a minimum, a quantitative chemical analysis or some other proof of its chemical individuality, X-ray powder data and basic optical data. The details under *Occurrence*, *Storage of type specimen* and *Name* are always required.

In general, polytypes should not receive individual mineral names, but should be designated in accordance with the "Report of the International Mineralogical Association (IMA) - International Union of Crystallography (IUCr) Joint Committee on Nomenclature" (Bailey 1978). Exceptions to this rule may be considered if supported by evidence of striking differences in the properties of the polytypes involved. New members of the pyrochlore or amphibole groups should be named in accordance with the schemes proposed by the subcommittees of the Commission (pyrochlores: Hogarth 1977; amphiboles: Leake 1978). The same holds for new members of mineral groups the classification and nomenclature of which may be reconsidered in the future (pyroxenes, micas, zeolites, etc.).

Other guidelines, highly recommended and in no way conflicting with the present suggestions, are formulated by the Commission on Crystallographic Data of the International Union of Crystallography (Kennard *et al.* 1967) and by the Commission on New Minerals and Min-

eral Names of the All-Union Mineralogical Society of the Academy of Sciences of U.S.S.R. (1975, 1977). The criteria of the Soviet Commission are recommended in particular as far as polymorphs (especially for order-disorder polymorphs), solid solutions, mixed-layer minerals and metamict minerals are concerned.

The requirements for amorphous minerals are currently under consideration.

Authors proposing new mineral names should read carefully the statement by F. Permingeat (approved by the I.M.A. Commission) in Hey *et al.* (1961).

*Introduction:* Statement of name, mineralogical classification (oxide, sulfate, etc.) and relationships, generalized characterization.

*Occurrence:* Locality (in identifiable form), type of host rock, paragenesis (including associated minerals, replacements, alterations, texture), abundance of mineral (tons or micrograms?), size of crystals.

*Chemistry:* Chemical analysis (state purity of samples); if electron-microprobe (or other instrumental) analyses were used, give the standards used, the number of determinations and the range of values (as well as the averages), actual and idealized formulae, determinative chemical reactions (especially fusibility and solubility), synthesis and stability relations (if known), DTA and TGA, especially for minerals containing volatile constituents.

*Crystallography:* Cell dimensions and volume, all with standard deviation (state numerical value of X-ray wavelength used); Laue class, diffraction aspect or space group (state extinctions observed); number of formula units (for actual formula) *per* cell (see Hey 1939, 1954); observed and calculated densities (discrepancy calls for comment); indexed X-ray powder data with relative intensities; relations to known phases; crystal structure, if determined (if not, state whether the structure is being determined or whether suitable material will be made available to another laboratory for structure determination).

Goniometric axial ratio(s) and angles; crystal

forms and form combinations; habit, malformation; cleavage(s) (Miller indices, quality, facility); twinning (twin law and composition surface); gliding; parting.

*Physical properties:* Color, lustre, streak, grain size; Mohs hardness or, at least for opaque minerals, micro-indentation hardness (Vickers) according to the rules of the I.M.A. Commission on Ore Microscopy (Criddle 1980); pyro- and piezoelectric properties; magnetic susceptibility; fluorescence; for transparent minerals containing H<sub>2</sub>O or OH, infrared absorption spectrum.

*Optical properties:* For transparent minerals, indices of refraction, optical sign, 2*V*, dispersion(s), optical orientation, elongation, pleochroism. Any optical property that may be observed on cleavage fragments or on prominent planes (Buttgenbach 1953, Table VIII, p. 735-739; Taylor, 1948).

It is recommended that the relationship between chemical composition, density and indices of refraction be checked by the Gladstone-Dale rule (Mandarino 1976, 1978, 1979, 1981). Where there are difficulties, or where the data are incomplete or approximate, an explanation is desirable.

For opaque minerals, color in air and oil; pleochroism, anisotropism (intensity and colors), polishing hardness and quality; reflectances in air and oil at least at the four standard wavelengths 470, 546, 589, 650 nm or, better, at every 20 nm from 400 to 700, stating the band width of the monochromator, the aperture used in the measurements, the standards of reflectance, the manufacturer of the oil; all these data for opaque minerals must be given according to the rules of the I.M.A. Commission for Ore Microscopy (Criddle 1980).

*Storage of type specimen:* State where (preferably a national museum) and how much type material is deposited, giving identification number(s) if possible.

*Name:* Derivation, pronunciation (preferably with international phonetic symbols). If a mineral is named for a living person, his or her consent must be obtained. If it is proposed to change an existing name, or to redefine an already named mineral, the person who gave the previous name must, if living, be given an opportunity to comment on the proposal.

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