ABSTRACTS, TWELFTH ANNUAL MEETING

ELEVEN NEW MINERALS FROM LÅNGBAN, SWEDEN

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Detailed studies on the Långban collection at the Swedish Natural History Museum revealed eleven new mineral species. Much of the credit belongs to the late Dr. Gustav Flink whose remarkable knowledge of minerals enabled him to single out many of these species—the 'Flink Unknown' series.

1. Wickmanite, Mn[Sn(OH)]₃, a = 7.87 Å, P₃₃₃, Z = 4 occurs as late-stage yellow octahedra in fissures.

2. Welinite, ideally Mn⁺³Mn⁺²SiO₄ with extensive W substitution for Mn, a = 8.155 Å, c = 4.785 Å, P₆₃, Z = 2, occurs as deep red-black subhedral crystals with adelite, sarkinite, etc. A crystal structure analysis of this peculiar mineral has just been completed.

3. Gabrielsonite, PbFe₂(AsO₄)(OH)₂, a = 7.86 Å, b = 5.98 Å, c = 8.62 Å, P₂₁ma, Z = 4, is related to the desclioizite-pyrobelonite group.

4. Ericssonite, Mn₂Fe⁺³Ba(Si₂O₇)(OH)₂, a = 20.32 Å, b = 7.03 Å, c = 5.34 Å, Immn (when l = 3n), Z = 4, is related to lamprophyllite.

5. Joesmithite, (Ca, Pb)₂Mg₄Fe⁺³Si₅O₁₈(OH)₁₈, a = 9.88 Å, b = 17.87 Å, c = 5.227 Å, β = 105°40', P₂/a or Pa, is a new kind of amphiboloid.

6. Parwelinite, Mn₄Sr(Si₂AsO₇)₂(AsO₄)₆(OH)₆, a = 9.76 Å, b = 19.32 Å, c = 10.06 Å, β = 95°54', T2/m or T2 (subcell): a/2, b/2, c/2, P2₁/m or P2₁, may be related to braunite.

7. Essexite, Mn₃(AsO₄)(OH)₂, a = 8.57 Å, b = 8.77 Å, c = 6.27 Å, Pnmn, Z = 4, is the manganese analogue of adamite.

8. Stenhuggarite, Ca₂Fe(SbO)(AsO₄)₂, a = 16.12 Å, c = 10.70 Å, I₄₁/amd, Z = 16, occurs as brilliant orange pseudo-octahedral crystals.

9. Jutgoldite, Ca₂Fe⁺²Fe⁺³₁₄₂(SiO₄)(Si₂O₇)(OH)₂(H₂O), a = 8.92 Å, b = 6.09 Å, c = 19.37 Å, β = 97°30', A₂/m, Z = 4, is the Fe⁺²-Fe⁺³ analogue of pumpellyte.

The above have been approved by the International Commission on New Mineral Names, IMA. The names of the following two will be released after approval.

10. M₃₃₃(AsO₄)₃, a = b = 19.32 Å, c = 19.71 Å, β = 90°, Z = 48, nearly I₄/mmm but symmetry and optics require it to be monoclinic, may be related to parwelinite.

11. Ca₂(Mg, Fe)₂SbSi₂O₁₂(OH)₃, a = 9.68 Å, b = 14.77 Å, c = 5.14 Å, β = 101°30', C₂/m, Z = 2, is presently undergoing crystal structure analysis.

OPTICAL SPECTRA OF IRON IN GARNETS

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The spectra of a number of natural garnets have been obtained in the range 0.35 to 3.5 microns. In the pyralspite garnets, the observed spectra are very complex: 12 bands can be assigned to Fe⁺⁺ eight-fold coordination. The intensities and band widths allow the grouping of the bands into: (1) three bands generally between 8,000 and 4,400 cm⁻¹ arising from spin-allowed transitions within the D ground state and (ii) nine bands between 30,000 and 14,000 cm⁻¹ arising from transitions between a quintet ground state and the low-lying triplet and/or singlet excited states. The large number of bands is due to the removal of all degeneracy by the crystal field of the distorted (D₂₋₂₂₂) cube site in the garnet structure. There are small shifts in frequency associated with small changes in inter-atomic distances but otherwise the spectra retain a remarkable similarity from one pyralspite garnet to another.

In the ugrandite garnets, the observed spectra are much simpler and are due to Fe⁺⁺⁺⁺ in the trigonally-distorted octahedral (S₄₋₃) site. This simplicity is to be expected since all transitions are spin-forbidden and very few levels are available for transitions in the range of observation. Selection rules have been calculated for all transitions and an assignment of the bands has been made.