ELEVEN NEW MINERALS FROM LÅNGBAN, SWEDEN

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Detailed studies on the Långban collection at the Swedish Natural History Museum revealed elven 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*, $Mn[Sn(OH)_6]$, $a = 7.87_3$ Å, $Pn3m$, $Z = 4$ occurs as late-stage yellow octahedra in fissures.
2. *Welinite*, ideally $Mn^{+3}Mn^{+2}_3SiO_7$ with extensive W substitution for Mn, $a = 8.155$ Å, $c = 4.785$ Å, $P6_3$, $Z = 2$, 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*, $PbFe(AsO_4)(OH)$, $a = 7.86$ Å, $b = 5.98$ Å, $c = 8.62$ Å, $P2_1ma$, $Z = 4$, is related to the descloizite-pyrobelonite group.
4. *Ericssonite*, $Mn_3Fe^{+3}Ba(Si_2O_7)(OH)$, $a = 20.32$ Å, $b = 7.03$ Å, $c = 5.34$ Å, $Immm$ (when $l = 3n$), $Z = 4$, is related to lamprophyllite.
5. *Joesmithite*, $(Ca, Pb)_{2-3}Mg_4Fe^{+3}_2Si_7)(O, OH)_{22}(OH)_6$, $a = 9.88$ Å, $b = 17.87$ Å, $c = 5.227$ Å, $\beta = 105°40'$, $P2/a$ or Pa, is a new kind of amphiboloid.
6. *Parwelite*, $Mn_5Sb(Si, As)_2O_{12-x}$, $a = 9.76$ Å, $b = 19.32$ Å, $c = 10.06$ Å, $\beta = 95°54'$, $I2/m$ or $I2$ (subcell): $a/2$, $b/2$, $c/2$, $P2_1/m$ or $P2_1$, may be related to braunite.
7. *Eveite*, $Mn_3(OH)(AsO_4)$, $a = 8.57$ Å, $b = 8.77$ Å, $c = 6.27$ Å, $Pnnm$, $Z = 4$, is the manganese analogue of adamite.
8. *Stenhuggarite*, $CaFe(SbO)(AsO_3)_2$, $a = 16.12$ Å, $c = 10.70$ Å, $I4_1/amd$, $Z = 16$, occurs as brilliant orange pseudo-octahedral crystals.
9. *Julgoldite*, $Ca_2Fe^{+2}Fe^{+3}_2(SiO_4)(Si_2O_7)(OH)_2(H_2O)$, $a = 8.92$ Å, $b = 6.09$ Å, $c = 19.37$ Å, $\beta = 97°30'$, $A2/m$, $Z = 4$, is the Fe^{+2}–Fe^{+3} analogue of pumpellyite.

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. $Mn_3(AsO_3)_2$, $a = b = 19.32$ Å, $c = 19.71$ Å, $\beta = 90°$, $Z = 48$, nearly $I4/mmm$ but symmetry and optics require it to be monoclinic, may be releated to parwelite.
11. $Ca_2(Mg, Fe)_4SbSi_4O_{12}(OH)_8$, $a = 9.68$ Å, $b = 14.77$ Å, $c = 5.14$ Å, $\beta = 101°30'$, $C2/m$, $Z = 2$, 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 ^5D 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 (D_2-222) 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 (S_6–$\bar{3}$) 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.