Mn-rich apatite from Cross Lake, Manitoba, Canada

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A Mn-rich apatite occurs in pegmatite #22 on the southeastern shoreline of a small, unnamed island in Cross Lake, Manitoba, Canada, about 5 km north-northwest of the Cross Lake settlement at 54º41'N 97º49'W [1], [2], [3]).

Associated minerals in the interior wall zone are fluorapatite, bobfergusonite, manitobaite, eosphorite, dickinsonite, triploidite, goyazite, perloffite, beusite, triplite, quartz, K-feldspar, muscovite, schorl, beryl, spessartine, gahnite and (Nb,Ta, Sn)-oxides. In the core zone, associates are fluorapatite, chlorapatite, triploidite, eosphorite, dickinsonite, fillowite, quartz, K-feldspar, muscovite, schorl, beryl, gahnite and (Nb,Ta,Sn)-oxides.

Fluorapatite is a common primary mineral in the core zone of the pegmatite whereas Mn-rich Cl-rich apatite occur in the interior wall zone as narrow veins and small inclusions in apatite and fine-grained aggregates of manitobaite, eosphorite, triploidite, *etc*., indicating crystallization from late-stage, residual pegmatitic fluids highly enriched in Mn and Cl.

Mn-rich apatite occurs as patches and veins in large crystals of apatite and Mn-bearing apatite in phosphate pods in the quartz core of a granitic pegmatite. The Mn content is inversely proportional to the size of the patches and the width of the veins.

Approximately forty-five samples were collected for a systematic mineralogical investigation of the pegmatite. Phosphate nodules in the interior and wall zones of the pegmatite and phosphate masses in the core zone. All of the primary phosphates present have very high values of Mn/(Mn + Fe^{2+}) and in some cases, these minerals have the richest Mn-values known for their species.

[1] Anderson (1984) MSc. thesis, University of Manitoba. [2] Ercit *et al* (1986) *Can. Min*. **24**, 599-604. [3] Ercit *et al* (1986) *Can Min*. **24**, 605-614.