Harrisonite $Ca(Fe^{2+},Mg)_6(SiO_4)_2(PO_4)_2$

Crystal Data: Hexagonal. *Point Group:* $\overline{3}\ 2/m$. In anhedral grains, to 2 mm; as rims on fluorapatite.

Physical Properties: *Cleavage:* Observed, very poor. *Fracture:* Conchoidal. *Tenacity:* Brittle. Hardness = < 5 D(meas.) = 4.02(3) D(calc.) = 4.01

Optical Properties: Translucent to transparent on thin edges. *Color:* Yellow-brown to orange-brown; pale yellow in thin section. *Streak:* Pale yellow. *Luster:* Vitreous. *Optical Class:* Uniaxial (–); slightly biaxial due to strain. *Pleochroism:* Slight, in shades of pale yellow. $\omega = 1.770(5)$ $\epsilon = 1.759(3)$ 2V(meas.) = ∼5°

Cell Data: *Space Group:* $R\overline{3}m$. $a = 6.248(1)$ $c = 26.802(7)$ Z = 3

X-ray Powder Pattern: Arcedeckne Island, Canada.
3.119 (100), 2.558 (100), 2.689 (80), 2.505 (80), 1.560 (80), 5.00 (60), 1.903 (60)

Chemistry:

	(1)
SiO_2	15.99
FeO	52.27
MnO	0.11
MgO	3.89
CaO	7.65
P_2O_5	19.18
Total	99.09

(1) Arcedeckne Island, Canada; by electron microprobe, average of four analyses, Ti, Al, Cr, Na, K, Cl, F absent; corresponds to $Ca_{1.01}(Fe_{5.36}Mg_{0.71}Mn_{0.01})_{\Sigma=6.08}(Si_{0.98}O_4)_2(P_{0.99}O_4)_2$.

Occurrence: A minor but wide-spread constituent in a layered iron silicate-quartz-apatite body in gneisses, probably a shaly and phosphatic iron formation metamorphosed to the granulite facies.

Association: Fluorapatite, quartz, fayalite, ferrosilite, almandine, ilmenite, biotite, zircon, monazite-(Ce).

Distribution: From Arcedeckne Island, near the Boothia Peninsula, District of Franklin, Arctic Canada.

Name: To honor Dr. James Merritt Harrison (1915–1990), former Director of the Canadian Geological Survey.

Type Material: Canadian Geological Survey, Ottawa, 66402; Canadian Museum of Nature, Ottawa, Canada, 59685.

References: (1) Roberts, A.C., J.A.R. Stirling, J.D. Grice, T. Frisch, R.K. Herd, and J.L. Jambor (1993) Harrisonite, a new calcium iron silicate-phosphate from Arcedeckne Island, District of Franklin, Arctic Canada. Can. Mineral., 31, 775–780. (2) Grice, J.D. and A.C. Roberts (1993) Harrisonite, a well-ordered silico-phosphate with a layered crystal structure. Can. Mineral., 31, 781–785. (3) (1994) Amer. Mineral., 79, 1010–1011 (abs. refs. 1 and 2).