Harrisonite \( \text{Ca(Fe}^{2+},\text{Mg})_6\text{(SiO}_4\text{)}_2\text{(PO}_4\text{)}_2 \)

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.) = \(\sim5\)°

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:

\[
\begin{array}{l|c}
\text{SiO}_2 & 15.99 \\
\text{FeO} & 52.27 \\
\text{MnO} & 0.11 \\
\text{MgO} & 3.89 \\
\text{CaO} & 7.65 \\
\text{P}_2\text{O}_5 & 19.18 \\
\hline
\text{Total} & 99.09 \\
\end{array}
\]

\( (1) \) Arcedeckne Island, Canada; by electron microprobe, average of four analyses, Ti, Al, Cr, Na, K, Cl, F absent; corresponds to \( \text{Ca}_{1.01}(\text{Fe}_{5.36}\text{Mg}_{0.71}\text{Mn}_{0.01})\Sigma=6.08(\text{Si}_{0.98}\text{O}_4\text{)}_2(\text{P}_{0.99}\text{O}_4\text{)}_2 \).

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.