Fermorite \((\text{Ca, Sr})_5(\text{PO}_4, \text{AsO}_4)_3(\text{F, OH})\)

Crystal Data: Monoclinic, pseudohexagonal. Point Group: \(2/m\). Crudely prismatic, massive, granular.

Physical Properties: Fracture: Uneven. Hardness = 5  \(D(\text{meas.}) = 3.518\)  \(D(\text{calc.}) = [3.41]\)


Cell Data: Space Group: \(P2_1/m\), pseudo-\(P6_3/m\).  \(a = 9.55\)  \(c = 6.98\)  \(Z = 2\)

X-ray Powder Pattern: Sitapar, India.
2.86 (10), 2.75 (6), 3.49 (5), 1.971 (4), 1.867 (4), 3.95 (3), 3.12 (3)

Chemistry:

\[
\begin{array}{lcc}
\text{P}_2\text{O}_{5} & 20.11 \\
\text{As}_2\text{O}_5 & 25.23 \\
\text{CaO} & 44.34 \\
\text{SrO} & 9.93 \\
\text{F} & 0.83 \\
\text{H}_2\text{O} & \text{trace} \\
\text{insol.} & 0.08 \\
\hline
\text{Total} & 100.17 \\
\end{array}
\]

(1) Sitapar, India; F determination probably low; corresponds to \((\text{Ca}_{4.46}\text{Sr}_{0.54})_{\Sigma=5.00}\)
\([\text{PO}_4]_{1.16}([\text{AsO}_4]_{1.24})_{\Sigma=5.00}(\text{F, OH})\).
(2) Do.; by electron microprobe, corresponds to \((\text{Ca}_{4.20}\text{Sr}_{0.80})_{\Sigma=5.00}\)
\([\text{PO}_4]_{1.45}(\text{AsO}_4)_{1.48})_{\Sigma=2.93}(\text{OH})_{0.66}(\text{F, OH})_{1.00}\).

Mineral Group: Apatite group.

Occurrence: A rare mineral in veinlets through a manganese deposit.

Association: Braunite, hollandite, pyrolusite.

Distribution: From Sitapar, Chhindwara district, Madhya Pradesh, India.

Name: Honors Dr. Lewis Leigh Fermor (1880–1954), former Director of the Geological Survey of India.
