Katoite \( \text{Ca}_3\text{Al}_2(\text{SiO}_4)_3 - x\text{(OH)}_{4x} \) (x = 1.5 to 3.0)

Crystal Data: Cubic. Point Group: 4/m 3 2/m. Octahedra crystals, typically rounded, to 0.3 mm, in thin crusts of columnar aggregates.


Optical Properties: Transparent to translucent. Color: Milky white; in transmitted light, colorless. Optical Class: Isotropic; may be weakly birefringent. \( n = 1.632(1) \)

Cell Data: Space Group: Ia\(3d\). \( a = 12.358(2) \) \( Z = 8 \)

X-ray Powder Pattern: Campomorto quarry, Italy. 2.763 (100), 2.257 (58), 2.004 (58), 3.089 (50), 5.046 (37), 1.6507 (37), 3.303 (32)

Chemistry:

\[
\begin{array}{ll}
\text{SiO}_2 & 10.58 \\
\text{Al}_2\text{O}_3 & 24.01 \\
\text{MgO} & 0.07 \\
\text{CaO} & 42.27 \\
\text{H}_2\text{O} & 20.8 \\
\text{SO}_3 & 2.27 \\
\hline
\text{Total} & [100.00]
\end{array}
\]

(1) Campomorto quarry, Italy; by electron microprobe, \( \text{H}_2\text{O} \) by TGA, recalculated slightly to 100.00%; corresponds to \( \text{Ca}_2.96(\text{Al}_{1.85}\text{Mg}_{0.01})\Sigma=1.86(\text{Si}_{0.69}\text{S}_{0.11})\Sigma=0.80[\text{OH}]_{0.07}\text{O}_{2.93}\Sigma=12.00 \).

Polymorphism & Series: Forms a series with grossular and hibschite.

Mineral Group: Garnet group.

Occurrence: A hydrothermal mineral in cavities in a phonolitic lava flow that erupted through an argillaceous marl.


Distribution: In the Campomorto quarry, near Montalto di Castro, Lazio, Italy.

Name: In honor of Akira Kato, mineralogist of the National Science Museum, Tokyo, Japan.

Type Material: Municipal Museum of Natural History, Milan, Italy; National Museum of Natural History, Washington, D.C., USA, 163797.