Kawazulite

\( \text{Bi}_2(\text{Te}, \text{Se}, \text{S})_3 \)

Crystal Data:  Hexagonal.  \textit{Point Group:} \( \overline{3}2/m \).  As very thin foils, to 4 mm across.

Physical Properties:  \textit{Cleavage:} Perfect on \{0001\}.  \textit{Tenacity:} Flexible.  \textit{Hardness} = 1.5 VHN = 100 (50 g load).  \( D(\text{meas.}) = > 7.5 \quad D(\text{calc.}) = 8.08 \)


\( R_1 - R_2: \)

\( (400) \quad 45.8 - 50.6, \quad (420) \quad 46.6 - 51.4, \quad (440) \quad 47.7 - 52.0, \quad (460) \quad 48.7 - 53.3, \quad (480) \quad 49.6 - 54.3, \quad (500) \quad 50.3 - 55.2, \quad (520) \quad 50.9 - 56.0, \quad (540) \quad 51.4 - 56.3, \quad (560) \quad 51.7 - 56.6, \quad (580) \quad 52.0 - 56.7, \quad (600) \quad 52.2 - 56.8, \quad (620) \quad 52.3 - 56.8, \quad (640) \quad 52.3 - 56.6, \quad (660) \quad 52.2 - 56.4, \quad (680) \quad 52.1 - 56.3, \quad (700) \quad 51.9 - 56.2 \)

Cell Data:  \textit{Space Group:} \( \overline{R}3m \).  \( a = 4.235 - 4.240 \quad c = 29.59 - 29.66 \quad Z = 3 \)

X-ray Powder Pattern:  Kawazu mine, Japan.

\[ 3.12 \ (100), \quad 2.31 \ (50), \quad 2.12 \ (50), \quad 4.92 \ (40), \quad 3.64 \ (30), \quad 2.61 \ (20), \quad 1.757 \ (20) \]

Chemistry:

\[
\begin{array}{cc}
\text{Bi} & 55.4 \quad 58.9 \\
\text{Te} & 31.9 \quad 25.9 \\
\text{Se} & 9.9 \quad 12.9 \\
\text{S} & 0.1 \quad 1.9 \\
\text{Total} & 97.3 \quad 99.6
\end{array}
\]

(1) Kawazu mine, Japan; by electron microprobe, corresponding to \( \text{Bi}_2(\text{Te}_{1.05}\text{Se}_{0.97}\text{S}_{0.03})_3 \).  
(2) Suttsu mine, Japan; by electron microprobe, corresponding to \( \text{Bi}_2(\text{Te}_{1.42}\text{Se}_{1.15}\text{S}_{0.42})_3 \).

Mineral Group:  Tetradyimite group.

Occurrence:  Of hydrothermal origin, in a quartz veins (Kawazu and Suttsu mines, Japan); in a breccia pipe cutting dacitic ignimbrites (Mazenod Lake, Canada).

Association:  Selenian tellurium (Kawazu mine, Japan); tellurobismuthite, uraninite, hematite, yarrowite (Mazenod Lake, Canada); selenian bismuthinite, selenian pavonite, cassiterite, chalcopyrite, pyrite (Suttsu mine, Japan).

Distribution:  In Japan, from the Kawazu mine, three km north of Shimoda, Izu Peninsula, Shizuoka Prefecture [TL], and at the Suttsu mine, Hokkaido.  From the Dianne Cu–U claims, Mazenod Lake, Northwest Territories, Canada.  In the USA, at the Lone Pine mine, near Silver City, Grant Co., New Mexico; in the Ward mine, south of Ely, Ward district, White Pine Co., and at Montreal Canyon, Fitting district, Mineral Co., Nevada.  From Jilové, Czech Republic.  At Ocna de Fier (Morávica; Vaskô), Romania.

Name:  For the Kawazu mine, Japan.

Type Material:  National Science Museum, Tokyo, Japan, M16403; National School of Mines, Paris, France; National Museum of Natural History, Washington, D.C., USA, 121926, 160136.


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