Grundmannite

Crystal Data: Orthorhombic.  

\textit{Point Group}: 2/m 2/m 2/m.  As grains to 250 μm.

Physical Properties:  
\textit{Cleavage}: Perfect on {001}.  \textit{Fracture}: Irregular.  \textit{Tenacity}: Brittle.  

Hardness = 2-2.5  \textit{VHN} = 53 (20 g load).  \text{D(meas.)} = \text{n.d.}  \text{D(calc.)} = 6.582


\textit{Optical Class}: Weakly birefringent.  \textit{Pleochroism}: Weak; cream to light gray.  

Distinctly anisotropic, light brown to brown.  

\( \text{R}_1 - \text{R}_2 \): (400) 40.7-42.3, (420) 40.7-42.6, (440) 40.8-42.8, (460) 40.9-43.1, (480) 41.0-43.6, 

(500) 41.2-44.1, (520) 41.4-46.6, (540) 41.8-45.0, (560) 41.9-45.6, (580) 42.0-45.5, (600) 42.2-45.8, 

(620) 42.3-46.0, (640) 42.5-46.1, (660) 42.5-46.3, (680) 42.5-46.5, (700) 42.5-46.6

Cell Data:  
\textit{Space Group}: Pnma.  
\( a = 6.6362(5) \)  \( b = 4.2581(3) \)  \( c = 15.3691(9) \)  \( Z = 4 \)

X-ray Powder Pattern:  
El Dragón selenide occurrence, Cordillera Oriental, southwestern Bolivia.

3.2746 (100), 3.3180 (70), 3.4901 (50), 2.3307 (50), 2.4923 (45), 2.1290 (35), 1.9927 (35)

Chemistry:  

\begin{tabular}{ll}
Cu & 14.88 \\
Hg & 0.07 \\
Pb & 1.23 \\
Ni & 0.05 \\
Bi & 44.9 \\
Se & 38.92 \\
Total & 100.05 \\
\end{tabular}

\begin{tabular}{ll}
(1) & 14.88 \\
(2) & 14.88 \\
\end{tabular}

(1) El Dragón selenide occurrence, Cordillera Oriental, southwestern Bolivia; average of 19 electron microprobe analyses; corresponds to Cu$_{0.96}$(Bi$_{0.91}$Pb$_{0.02}$)$_{0.02}$Se$_{2.08}$.  

(2) CuBiSe$_2$.

Occurrence: A primary mineral, deposited from oxidizing low-temperature hydrothermal fluids at the waning stage of selenide formation in a telethermal vein.

Association:  Watkinsonite, clausthalite, krut’aite-penroseite.

Distribution: From the El Dragón selenide occurrence, Cordillera Oriental, Department of Potosí, southwestern Bolivia.

Name: Honors Günter Grundmann (b. 1947), for his pioneering work on the El Dragón mine.

