Theisite  

\[ \text{Cu}_5\text{Zn}_5(\text{AsO}_4,\text{SbO}_4)_{2}(\text{OH})_{14} \]

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Crystalline Data:  
Orthorhombic (probable), pseudohexagonal.  
Point Group: n.d.  
Crystal cleavage plates are usually curved or crumpled, to 2 mm; may be micaceous, lamellar, in spherical aggregates and crusts.

Physical Properties:  
Cleavage: Perfect on \{001\}.  
Tenacity: Sectile.  
Hardness = 1.5  
\( D(\text{meas.}) = 4.3 \)  
\( D(\text{calc.}) = 4.45 \)

Optical Properties:  
Semitransparent.  
Color: Greenish blue, turquoise-blue, pale turquoise-green, pale emerald-green; pale blue-green in transmitted light.  
Streak: White.  
Luster: Pearly on cleavages.  
Optical Class: Biaxial (-), nearly uniaxial (-).  
\( \alpha = 1.755 \)  
\( \beta = 1.785 \)  
\( \gamma = 1.785 \)  
\( 2V(\text{meas.}) = \approx 0^\circ \)

Cell Data:  
Space Group: n.d.  
\( a = 8.220-8.225 \)  
\( b = 7.123 \)  
\( c = 14.934-15.019 \)  
\( Z = 2 \)

X-ray Powder Pattern:  
Near Durango, Colorado, USA.  
3.741 (10), 14.97 (9), 2.534 (9), 7.483 (5), 1.830 (5), 1.533 (5), 4.112 (4)

Chemistry:  
(1)  
\begin{align*}  
\text{As}_2\text{O}_5 & \quad 14.8 & 14.06 & 13.03 \\
\text{Sb}_2\text{O}_5 & \quad 7.0 & 8.11 & 9.92 \\
\text{CuO} & \quad 33.3 & 34.32 & 33.97 \\
\text{ZnO} & \quad 33.1 & 35.83 & 34.50 \\
\text{CaO} & \quad 0.3 & & \\
\text{H}_2\text{O} & \quad 10.5 & & 
\end{align*}  

Total 99.0  
(2)  
\begin{align*}  
[\text{As}_{0.74}\text{Sb}_{0.26}]_{2} & \quad [\text{O}_{4.2}]_{2}(\text{OH})_{13.6} \\
\text{Cu}_{0.4} & \quad 28.2 \\
\text{Zn}_{0.7} & \quad 24.6 \\
\text{Ca}_{0.6} & \quad 4.2 \\
\text{H}_2\text{O} & \quad 10.1 
\end{align*}  

(3)  
\begin{align*}  
[\text{As}_{0.65}\text{Sb}_{0.35}]_{2} & \quad [\text{O}_{4.9}]_{2}(\text{OH})_{13.6} \\
\text{Cu}_{0.3} & \quad 27.4 \\
\text{Zn}_{0.7} & \quad 24.6 \\
\text{Ca}_{0.6} & \quad 4.2 \\
\text{H}_2\text{O} & \quad 10.1 
\end{align*}  

Occurrence:  
A rare secondary mineral in thin seams cutting other oxidized minerals (near Durango, Colorado, USA); in dolomitized marble (Forno, Italy).

Association:  
Cuprite, malachite, azurite, kolwezite, partzite, parnauite, anglesite, cerussite, tenorite, adamite, hemimorphite, chrysocolla, zeunerite, duftite (near Durango, Colorado, USA); azurite, chrysocolla (Sa Duchessa mine, Italy); cinnabar, tetrahedrite, azurite, malachite, fluorite (Forno, Italy).

Distribution:  
From the Tucker’s tunnel uranium deposit, near Durango, Hinsdale Co., Colorado, USA. At the Tynagh mine, near Loughrea, Co. Galway, Ireland. In Germany, from the Glücksrade mine, Oberschulenberg, Harz Mountains; in the Richelsdorf Mountains, Hesse; at the Clara mine, near Oberwolfach, Black Forest. From near Padern, Pyrénées-Orientales, France. In Italy, at the Sa Duchessa mine, Oridda district, and the Is Murvonis mine, Domusnovas, Sardinia; at Canale Fondone, near Forno, Piedmont. From Brixlegg, Tirol, Austria.

Name:  
To honor Dr. Nicholas J. Theis, who provided the first specimens.

Type Material:  

References:  