08.4-24 CRYSTAL CHEMISTRY OF SYLVANITE AND KRENNERITE. By F. Pertlik, Institut für Mineralogie und Kristallographie der Universität Wien, Austria.

The crystal structures of the minerals sylvanite, AuAgTe₄, (TUNELL, G., Am. Min. 28, 457, 1941) and krennerite (Au, Ag)₂Te₂, (TUNELL, G., MURATA, K., J., Am. Min. 22, 599, 1950) were redetermined using single crystal X-ray data. Three dimensional data were collected on a Weissenberg type diffractometer (MoKα radiation, sin θ/λ = 0.7°).

Sylvanite has a stoichiometric composition and a ordered crystal structure. The Au atom is surrounded by six Te atoms in a [4+2]+ coordination around the Ag atom also six Te atoms are arranged in a [2+2+2]+ coordination. The polyhedra are combined via common Te-Te edges to planar sheets, which are connected by Te₂ dumbbells (Te-Te = 2.66 Å) to a network.

Within the structure of krennerite, two of the three crystallographic different metal positions are occupied by (Au, Ag) atoms (ratio Au:Ag ~ 0.75:0.25) in a [2+2+2]+ coordination by Te atoms.

The third position is occupied by (Au₂-xAgx)Au₂[Te₃]₂[Te₂]ₓ atoms. Krennerite is the first representative for a Te₃ group in crystal chemistry of minerals. The formula can be written as follows:

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(Au_{2-x}Ag_x)Au_2[Te_3]_2[Te_2]_x; x \approx 0.75
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