

Crystal Data: Hexagonal. *Point Group:* $\bar{3} 2/m$. Pseudocubic crystals, to 0.3 mm.

Physical Properties: *Fracture:* Irregular. Hardness = ~ 4 D(meas.) = 1.90(3)
D(calc.) = 1.87

Optical Properties: Transparent. *Color:* Colorless. *Luster:* Vitreous.
Optical Class: Uniaxial (+). $\omega = 1.4941(4)$ $\epsilon = 1.4960(4)$

Cell Data: *Space Group:* $R\bar{3}c$. $a = 11.350(1)$ $c = 28.321(2)$ $Z = 6$

X-ray Powder Pattern: Hannebacher Ley volcano, Germany.
5.73 (100), 8.11 (80), 2.69 (80), 3.63 (60), 3.28 (40), 2.11 (40), 4.87 (30)

Chemistry: (1) Hannebacher Ley volcano, Germany; characterized by the identity of the X-ray pattern with that of synthetic material, as well as crystal-structure analysis of the natural mineral.

Occurrence: A rare species, an intermediate stage in oxidation of sulfides to sulfates, preserved in a melilite nepheline leucitite quenched during a submarine volcanic eruption.

Association: Clinopyroxene, apatite, phillipsite, calcite.

Distribution: From the Hannebacher Ley volcano, one km east-northeast of Hannebach, Eifel, Germany.

Name: To honor P. Orschall, Cologne, Germany, who discovered the mineral.

Type Material: Institute of Mineralogy and Crystallography, University of Vienna, Vienna, Austria.

References: (1) Weidenthaler, C., E. Tillmanns, and G. Hentschel (1993) Orschallite, $\text{Ca}_3(\text{SO}_3)_2\text{SO}_4 \cdot 12\text{H}_2\text{O}$, a new calcium-sulfite-sulfate-hydrate mineral. *Mineral. Petrol.*, 48, 167–177. (2) (1994) *Amer. Mineral.*, 79, 572 (abs. ref. 1).