

**Crystal Data:** Monoclinic. *Point Group:*  $2/m$ . As tabular crystals, flattened on {001}, with square to rectangular outline, showing {001}, {100} and {110}, to 2 mm; in scaly aggregates.

**Physical Properties:** *Cleavage:* Perfect on {001}; distinct on {100}. *Tenacity:* Brittle. Hardness = 2.5  $D(\text{meas.}) = \text{n.d.}$   $D(\text{calc.}) = 3.579$  [Synthetic.] Fluoresces bright green to greenish yellow under SW and LW UV; dehydrates rapidly to metaheinrichite. Radioactive.

**Optical Properties:** Transparent to translucent. *Color:* Yellow to greenish yellow; pale yellow to colorless in transmitted light. *Streak:* White. *Luster:* Vitreous to pearly.

*Optical Class:* Uniaxial (-), anomalously biaxial (-).  $\omega = 1.605(2)$   $\varepsilon = 1.573(2)$   
 $2V(\text{meas.}) = 20^\circ\text{-}38^\circ$  *Pleochroism:*  $O = \text{pale yellow}$ ;  $E = \text{colorless}$ . *Absorption:*  $E < O$ .

**Cell Data:** *Space Group:*  $P2_1/c$ .  $a = 7.1548(11)$   $b = 7.1340(11)$   $c = 21.290(3)$   $\beta = 104.171(5)^\circ$   
 $Z = 2$

**X-ray Powder Pattern:** Black Forest, Germany.  
3.57 (10), 8.89 (8), 5.03 (8), 3.38 (7), 2.25 (5), 2.11 (5), 2.53 (2)

**Chemistry:** (1) No chemical analysis available; the formula is based on the similarity of its X-ray pattern to that of zeunerite and synthetic  $\text{Ba}(\text{UO}_2)_2(\text{AsO}_4)_2 \cdot 10\text{H}_2\text{O}$ , and chemical analyses of metaheinrichite.

**Mineral Group:** Autunite group.

**Occurrence:** A secondary mineral in oxidized uranium deposits.

**Association:** Metaheinrichite, zeunerite, nováčekite, erythrite, pitticite, arseniosiderite, uraninite.

**Distribution:** From the White King mine, about 22 km northwest of Lakeview, Lake Co., Oregon, USA. In Germany, in the Black Forest, from the Sophia mine and on the Schmiedestollen dump, near Wittichen; at Reinerzau, near Alpirsbach; in the Michael mine, Weiler, near Lahr; near Schramberg and Triberg, Hammereisenbach, Menzenschwand; in the Anton mine, Heubachtal, near Schiltach; and in Bavaria, at Sailauf, northeast of Aschaffenburg. In the Riviéral mine, Lodève, Hérault, France.

**Name:** Honors Professor Eberhardt William *Heinrich* (1918-1991), mineralogist, University of Michigan, Ann Arbor, Michigan, USA.

**Type Material:** National Museum of Natural History, Washington, D.C., USA, 121950.

**References:** (1) Gross, E.B., A.S. Corey, R.S. Mitchell, and K. Walenta (1958) Heinrichite and metaheinrichite, hydrated barium uranyl arsenate minerals. *Amer. Mineral.*, 43, 1134-1143. (2) Walenta, K. (1965) Beiträge zur Kenntnis seltener Arsenatmineralien unter besonderer Berücksichtigung von Vorkommen des Schwarzwaldes. 2. Folge. *Tschermaks Mineral. Petrog. Mitt.*, 9, 252-282, esp. 263-275 (in German). (3) Locock, A.J., P.C. Burns, and T.M. Flynn (2005) Structures of strontium- and barium-dominant compounds that contain the autunite-type sheet. *Can. Mineral.*, 43, 721-733. (4) (2005) *Amer. Mineral.*, 90(11), 1951 (abs. ref. 3).