

**Crystal Data:** Tetragonal. *Point Group:*  $4/m\ 2/m\ 2/m$ . Crystals platy || {001}, to 0.5 mm.

**Physical Properties:** Hardness = 2–3 D(meas.) = n.d. D(calc.) = 6.25

**Optical Properties:** Semitransparent. *Color:* Yellow-orange to yellow-brown. *Streak:* Yellow. *Luster:* Adamantine.

*Optical Class:* Uniaxial (+). *Pleochroism:* *O* = bright yellow; *E* = brownish yellow.  $\omega = > 2.0$   
 $\epsilon = > 2.0$

**Cell Data:** *Space Group:*  $I4_1/amd$ .  $a = 7.303(3)$   $c = 6.584(3)$   $Z = 4$

**X-ray Powder Pattern:** Hirschhorn, Germany.

3.656 (100), 2.739 (60), 4.85 (40), 1.878 (40), 2.918 (20), 2.280 (20), 2.583 (15)

**Chemistry:**

	(1)	(2)	(3)
V <sub>2</sub> O <sub>5</sub>	28.55	28.8	28.07
Bi <sub>2</sub> O <sub>3</sub>	71.9	69.3	71.93
CaO	0.9	1.0	
Total	101.3	99.1	100.00

(1–2) Hirschhorn, Germany; by electron microprobe; the average corresponding to (Bi<sub>0.96</sub>Ca<sub>0.05</sub>)<sub>Σ=1.01</sub>VO<sub>4</sub>. (3) BiVO<sub>4</sub>.

**Polymorphism & Series:** Trimorphous with clinobisvanite and pucherite.

**Occurrence:** In rhyolitic tuffs, intercalated with carbonaceous matter and silicified wood.

**Association:** Bismite, mixite, carnotite, silver, chlorargyrite, kaolinite, hematite, goethite, barite, quartz.

**Distribution:** From Hirschhorn, near Kaiserlautern, Rhineland-Palatinate, Germany.

**Name:** In honor of Gerhard Dreyer, Assistant Professor, Johannes Gutenberg University, Mainz, Germany, who found the mineral.

**Type Material:** Johannes Gutenberg University, Mainz, Germany; National Museum of Natural History, Washington, D.C., USA, 159922.

**References:** (1) Dreyer, G. and E. Tillmanns (1981) Dreyerit: ein natürliches, tetragonales Wismutvanadat von Hirschhorn/Pfalz. Neues Jahrb. Mineral., Monatsh., 151–154 (in German with English abs.). (2) (1982) Amer. Mineral., 67, 622 (abs. ref. 1). (3) Hazen, R. and J.W.E. Mariathasan (1982) Bismuth vanadate: a high-pressure, high-temperature crystallographic study of the ferroelastic-paraelastic transition. Science, 216, 991–993.