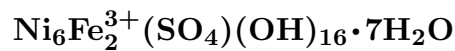


## Hydrohonessite



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**Crystal Data:** Hexagonal. *Point Group:* n.d. As microscopic hexagonal flakes, to 10  $\mu\text{m}$ .

**Physical Properties:** Hardness = n.d. D(meas.) = n.d. D(calc.) = 2.96

**Optical Properties:** Transparent to translucent. *Color:* Bright yellow; bright yellow in transmitted light. *Luster:* [Adamantine.]

*Optical Class:* Uniaxial (-).  $\omega = 1.63$   $\epsilon = 1.59$

**Cell Data:** *Space Group:* n.d.  $a = 3.09$   $c = 10.80$   $Z = \text{n.d.}$

**X-ray Powder Pattern:** Otter Shoot mine, Western Australia.  
11.0 (10), 5.56 (5), 3.68 (4), 2.709 (3), 2.595 (2), 2.394 (2), 2.152 (1)

**Chemistry:** (1) Otter Shoot mine, Kambalda, and Carr Boyd Rocks mine, Australia; by electron microprobe, partial analysis yielded Ni 25.7%, Fe 10.3%,  $\text{SO}_4$  15.6%, which, after a number of crystal-structure assumptions, is stated to correspond to  $\text{Ni}_{6.4}\text{Fe}_{2.6}^{3+}(\text{SO}_4)_{2.3}(\text{OH})_{16}\cdot 7.0\text{H}_2\text{O}$ .

**Occurrence:** Incrusting fractures in the oxidized portions of Ni-Fe sulfide deposits (Otter Shoot mine and Carr Boyd mine, Australia); or in chromitite (Unst, Scotland; Linden, Wisconsin, USA).

**Association:** Honessite, reevesite, magnesite, gaspéite, pecoraite, goethite, gypsum (Otter Shoot mine and Carr Boyd mine, Australia); honessite, reevesite, theophrastite (Unst, Scotland); wupatkiite, nickel-boussingaultite, pickeringite (Cameron district, Arizona, USA).

**Distribution:** In Australia, from the Otter Shoot nickel mine, Kambalda, 56 km south of Kalgoorlie; at the Carr Boyd Rocks nickel mine, Yerilla district, 80 km north-northeast of Kalgoorlie; and in the 132 North nickel mine, four km southwest of Widgiemooltha, Western Australia. At the Hagdale quarry, Unst, Shetland Islands, Scotland. In the USA, from near Linden, Iowa Co., Wisconsin; in a prospect 13 km east-southeast of Gray Mountain, Cameron district, Coconino Co., Arizona.

**Name:** As the hydrated analog of *honessite*.

**Type Material:** Western Australian Museum, Perth, Australia, M.77a.1991, M.77b.1991; National Museum of Natural History, Washington, D.C., USA, 150420.

**References:** (1) Nickel, E.H. and J.E. Wildman (1981) Hydrohonessite — a new hydrated Ni-Fe hydroxy-sulphate mineral; its relationship to honessite, carrboydite, and minerals of the pyroaurite group. *Mineral. Mag.*, 44, 333–337. (2) Bish, D.L. and A. Livingstone (1981) The crystal chemistry and paragenesis of honessite and hydrohonessite: the sulphate analogues of reevesite. *Mineral. Mag.*, 44, 339–343. (3) (1982) *Amer. Mineral.*, 67, 623 (abs. ref. 1 and 2).