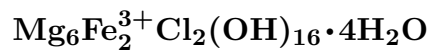


# Iowaite



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**Crystal Data:** Hexagonal. *Point Group:*  $\bar{3} 2/m$ . As platy crystals, to 2.5 cm, in masses in veins.

**Physical Properties:** *Cleavage:* {0001}, perfect. *Tenacity:* Waxy, becoming friable after contact with air. Hardness = 1.5–2.5  $D(\text{meas.}) = 2.09$   $D(\text{calc.}) = 2.04$  Greasy or soapy feel.

**Optical Properties:** Opaque to translucent. *Color:* Bluish green, becoming pale green with a rusty red tint on exposure to air (alteration to pyroaurite), yellowish to colorless, may be zoned; colorless in transmitted light. *Streak:* White. *Luster:* Greasy.

*Optical Class:* Uniaxial (–); commonly anomalously biaxial. *Pleochroism:* Intense; *O* = pale yellow; *E* = deep blue-green.  $\omega = 1.543\text{--}1.561$   $\epsilon = 1.533\text{--}1.543$   $2V(\text{meas.}) = 5^\circ$

**Cell Data:** *Space Group:*  $R\bar{3}m$ .  $a = 3.1183(9)$   $c = 24.113(8)$   $Z = 3/8$

**X-ray Powder Pattern:** Sioux Co., Iowa, USA.

8.109 (100), 4.047 (40), 2.363 (27), 2.019 (23), 2.639 (17), 1.530 (13), 1.560 (8)

**Chemistry:**

|                                   | (1)  | (2)    |
|-----------------------------------|------|--------|
| Fe <sub>2</sub> O <sub>3</sub>    | 24.6 | 23.74  |
| MgO                               | 35.3 | 35.95  |
| Cl                                | 7.0  | 10.54  |
| H <sub>2</sub> O <sup>200°C</sup> | 11.  |        |
| H <sub>2</sub> O                  |      | 32.14  |
| CO <sub>2</sub>                   | 0.4  |        |
| –O = Cl <sub>2</sub>              |      | 2.37   |
| Total                             |      | 100.00 |

(1) Phalaborwa mine, South Africa; by electron microprobe, total Fe as Fe<sub>2</sub>O<sub>3</sub>, H<sub>2</sub>O<sup>200°C</sup> by TGA. (2) Mg<sub>6</sub>Fe<sub>2</sub>Cl<sub>2</sub>(OH)<sub>16</sub>•4H<sub>2</sub>O.

**Mineral Group:** Hydrotalcite group.

**Occurrence:** An alteration product of serpentine.

**Association:** Chrysotile, dolomite, brucite, calcite, magnesite, pyrite, pyroaurite (Sioux Co., Iowa, USA); magnetite, chondrodite, clinochlore, brucite, hydrotalcite, phlogopite, fluorborite, apatite, celestine, antigorite, calcite, dolomite (Phalaborwa mine, South Africa).

**Distribution:** In drill core from the Precambrian basement of Sioux Co., Iowa, USA. In the Phalaborwa mine, Transvaal, South Africa. Large crystals from the Komsomolsk mine, Talnakh, Noril'sk region, western Siberia, Russia. In the Almalyk district, Uzbekistan. From sea floor sediments in the Bonin-Mariana area, Pacific Ocean. At the Mount Keith nickel deposit, 400 km north-northwest of Kalgoorlie, Western Australia.

**Name:** For its occurrence in the state of Iowa, USA.

**Type Material:** National Museum of Natural History, Washington, D.C., USA, 121706.

**References:** (1) Kohls, D.W. and J.L. Rodda (1967) Iowaite, a new hydrous magnesium hydroxide-ferric oxychloride from the Precambrian of Iowa. *Amer. Mineral.*, 52, 1261–1271. (2) Allmann, R. and J.D.H. Donnay (1969) About the structure of iowaite. *Amer. Mineral.*, 54, 296–299. (3) Braithwaite, R.S.W., P.J. Dunn, R.G. Pritchard, and W.H. Paar (1994) Iowaite, a re-investigation. *Mineral. Mag.*, 58, 79–85.