

**Woodallite****Mg<sub>6</sub>Cr<sub>2</sub>(OH)<sub>16</sub>Cl<sub>2</sub>·4H<sub>2</sub>O**

**Crystal Data:** Hexagonal. *Point Group:*  $\bar{3}m$ . As platelets, commonly curved or crenulated, to 100  $\mu\text{m}$ , that form compact clusters and whorls to 6 mm.

**Physical Properties:** *Cleavage:* Perfect on {0001}. *Fracture:* n.d. *Tenacity:* Flexible, inelastic. Hardness = 1.5-2 D(meas.) = 2.062(5) D(calc.) = 2.023

**Optical Properties:** Transparent. *Color:* Purple to deep magenta; pale pink in transmitted light. *Streak:* Pale pink to white. *Luster:* Resinous to waxy. *Optical Class:* Uniaxial (-).  $\omega = 1.555$   $\varepsilon = 1.535$  *Pleochroism:* Distinct, violet to pinkish lilac.

**Cell Data:** Space Group:  $R\bar{3}m$ .  $a = 3.103(2)$   $c = 24.11(2)$   $Z = 3/8$

**X-ray Powder Pattern:** Mount Keith nickel deposit, Western Australia. 8.0361 (100), 4.0205 (48), 2.0072 (6), 2.3488 (5), 2.6239 (3), 1.6977 (2), 1.5237 (2)

<b>Chemistry:</b>	(1)	(2)
Mg	22.90	21.93
Cr	9.56	15.64
Fe	4.30	
Al	0.60	
Cl	8.71	10.66
S	0.03	
CO <sub>3</sub>	1.52	
OH	[41.40]	40.93
H <sub>2</sub> O	[10.96]	10.84
Total	100.00	100.00

(1) Mount Keith nickel deposit, Western Australia; electron microprobe analysis supplemented by DTA, CO<sub>3</sub> by Leco carbon analyzer, OH and H<sub>2</sub>O calculated, corrected to allow for H<sub>2</sub>O+OH lost in high vacuum and under electron beam; corresponds to Mg<sub>6.19</sub>(Cr<sup>3+</sup><sub>1.21</sub>Fe<sup>3+</sup><sub>0.51</sub>Al<sub>0.15</sub>) $\Sigma=1.87$ (OH)<sub>16</sub>[Cl<sub>1.62</sub>(CO<sub>3</sub>)<sub>0.17</sub>(SO<sub>4</sub>)<sub>0.01</sub>] $\Sigma=1.80$ ·4H<sub>2</sub>O. (2) Mg<sub>6</sub>Cr<sub>2</sub>(OH)<sub>16</sub>Cl<sub>2</sub>·4H<sub>2</sub>O.

**Polymorphism & Series:** Solid solution with stichtite. 3R polytype.

**Mineral Group:** Hydrotalcite supergroup, hydrotalcite group.

**Occurrence:** In a low-grade, disseminated nickel sulfide deposit in lizardite+brucite-altered dunite formed by hydrothermal alteration of primary magmatic chromite by Cl-rich solutions at temperatures < 320°C.

**Association:** Chromite, lizardite, brucite, iowaite, pentlandite, magnetite, tochilinite.

**Distribution:** From the Mount Keith nickel deposit, about 90 km NNE of Leinster, northeastern Goldfields district, Western Australia.

**Name:** Honors Australian geologist Roy Woodall (b. 1930) who was instrumental in the initiation and development of the nickel and alumina industries in Western Australia.

**Type Material:** South Australian Museum, Adelaide (G25116), the Western Australian Museum, Perth (WAM M1.2000), and the Museum of Victoria, Melbourne (M46222), Australia.

**References:** (1) Grguric, B.A., I.C. Madsen, and A. Pring (2001) Woodallite, a new chromium analogue of iowaite from the Mount Keith nickel deposit, Western Australia. *Mineral. Mag.*, 65(3), 427-435. (2) (2002) *Amer. Mineral.*, 87(1), 182 (abs. ref. 1). (3) Mills, S. J., A. G. Christy, J.-M. R. Ge'nin, T. Kameda, and F. Colombo (2012) Nomenclature of the hydrotalcite supergroup: natural layered double hydroxides. *Mineral. Mag.*, 76(5), 1289-1336.