Woodallite $Mg_6Cr_2(OH)_{16}Cl_2{\cdot}4H_2O$

Crystal Data: Hexagonal. *Point Group*: $\bar{3}\,m$. As platelets, commonly curved or crenulated, to 100 μm, 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)

Chemistry:

	(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_3	1.52	
OH	[41.40]	40.93
H_2O	[10.96]	10.84
Total	100.00	100.00

(1) Mount Keith nickel deposit, Western Australia; electron microprobe analysis supplemented by DTA, CO_3 by Leco carbon analyzer, OH and H_2O calculated, corrected to allow for H_2O+OH lost in high vacuum and under electron beam; corresponds to $Mg_{6.19}(Cr^{3+}_{1.21}Fe^{3+}_{0.51}Al_{0.15})_{\Sigma=1.87}(OH)_{16}[Cl_{1.62}(CO_3)_{0.17}(SO_4)_{0.01}]_{\Sigma=1.80}{\cdot}4H_2O$. (2) $Mg_6Cr_2(OH)_{16}Cl_2{\cdot}4H_2O$.

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 < 320ºC.

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.