

Coombsite **$\text{K}(\text{Mn}^{2+}, \text{Fe}^{2+}, \text{Mg})_{13}(\text{Si}, \text{Al})_{18}\text{O}_{42}(\text{OH})_{14}$**

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Crystal Data: [Hexagonal] (by analogy to zussmanite). *Point Group:* [3 or $\bar{3}$] Fibrous crystals, to 20 μm , in patchy spherulitic aggregates.

Physical Properties: Hardness = n.d. $D(\text{meas.}) = 3.0(1)$ $D(\text{calc.}) = 3.063$

Optical Properties: Semitransparent. *Color:* Pale yellowish brown.

Optical Class: Uniaxial (-). *Absorption:* Weak; $O > E$. $\omega = 1.619(1)$ $\epsilon = 1.600(1)$

Cell Data: *Space Group:* [$R\bar{3}$ or $R\bar{3}$] $a = 11.828(2)$ $c = 29.146(9)$ $Z = 3$

X-ray Powder Pattern: Watson's Beach, New Zealand; closely resembles zussmanite. 9.68 (100), 2.556 (90), 2.793 (70), 2.241 (50), 4.835 (30), 3.241 (25)

Chemistry:

	(1)
SiO_2	45.18
TiO_2	0.01
Al_2O_3	3.59
FeO	3.28
MnO	38.19
MgO	1.08
CaO	0.03
Na_2O	0.08
K_2O	2.19
H_2O	[6.37]
Total	[100.00]

(1) Watson's Beach, New Zealand; by electron microprobe, H_2O by difference; corresponds to $(\text{K}_{1.01}\text{Na}_{0.06})_{\Sigma=1.07}(\text{Mn}_{11.75}\text{Fe}_{1.00}\text{Mg}_{0.58})_{\Sigma=13.33}(\text{Si}_{16.41}\text{Al}_{1.54})_{\Sigma=17.95}\text{O}_{42}(\text{OH})_{14}$.

Occurrence: In a manganese-rich rock in metagraywacke-argillite in the pumpellyite-prehnite facies.

Association: Rhodonite, quartz, rhodochrosite, kutnohorite, manganoan calcite, spessartine, apatite, parsettensite, caryopilite.

Distribution: At Watson's Beach, southeastern Otago, New Zealand.

Name: For Professor Douglas Saxon Coombs (1924–), mineralogist and petrologist, University of Otago, Dunedin, New Zealand.

Type Material: University of Otago, Dunedin, New Zealand; National Museum of Natural History, Washington, D.C., USA.

References: (1) Sameshima, T. and Y. Kawachi (1991) Coombsite, Mn analogue of zussmanite, and associated Mn-silicates, parsettensite and caryopilite, from southeast Otago, New Zealand. *New Zealand J. Geol. Geophys.*, **34**, 329–335. (2) (1992) *Amer. Mineral.*, **77**, 671 (abs. ref. 1).