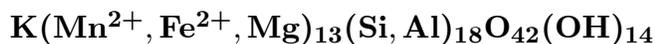


**Coombsite**

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**Crystal Data:** [Hexagonal] (by analogy to zussmanite). *Point Group:* [3 or  $\bar{3}$ ] Fibrous crystals, to 20  $\mu\text{m}$ , 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)

<b>Chemistry:</b>	(1)
	SiO <sub>2</sub> 45.18
	TiO <sub>2</sub> 0.01
	Al <sub>2</sub> O <sub>3</sub> 3.59
	FeO 3.28
	MnO 38.19
	MgO 1.08
	CaO 0.03
	Na <sub>2</sub> O 0.08
	K <sub>2</sub> O 2.19
	H <sub>2</sub> O [6.37]
	<hr/> Total [100.00]

(1) Watson's Beach, New Zealand; by electron microprobe, H<sub>2</sub>O 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).