

# Macaulayite



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**Crystal Data:** Monoclinic. *Point Group:* n.d. As < 2  $\mu\text{m}$  platy grains.

**Physical Properties:** *Cleavage:* {001}, strongly suspected. Hardness = n.d.  
D(meas.) = n.d. D(calc.) = 4.41

**Optical Properties:** Translucent. *Color:* Red; in transmitted light, pale red to yellowish.  
*Luster:* Earthy.  
*Optical Class:* Biaxial.  $n = > 1.74$   $2V(\text{meas.}) = \text{n.d.}$

**Cell Data:** *Space Group:* C-centered cell.  $a = 5.038$   $b = 8.726$   $c = 36.342$   $\beta = 92^\circ$   
 $Z = 2$

**X-ray Powder Pattern:** Bennachie, Scotland; strongest two lines from oriented sample. Basal planes expand after glycol treatment.

36.6 (vs), 18.16 (vs), 2.533 (100), 2.720 (35), 1.462 (35), 3.700 (25), 2.214 (20)

**Chemistry:**

	(1)
SiO <sub>2</sub>	10.48
Al <sub>2</sub> O <sub>3</sub>	3.71
Fe <sub>2</sub> O <sub>3</sub>	78.41
H <sub>2</sub> O	[7.4]
Total	[100.00]

(1) Bennachie, Scotland; by electron microprobe, average of 14 analyses, recalculated from anhydrous analyses; corresponds to  $\text{Fe}_{22.38}^{3+}\text{Al}_{1.69}\text{Si}_{3.98}\text{O}_{43}(\text{OH})_2$ .

**Occurrence:** A secondary mineral formed in deeply weathered granite.

**Association:** Kaolinite, illite.

**Distribution:** From Bennachie, near Inverurie, Aberdeenshire, Scotland.

**Name:** For the Macaulay Institute for Soil Research, Aberdeen, Scotland.

**Type Material:** Royal Scottish Museum, Edinburgh, Scotland; The Natural History Museum, London, England.

**References:** (1) Wilson, M.J., J.D. Russell, J.M. Tait, D.R. Clark, A.R. Fraser, and I. Stephen (1981) A swelling hematite/layer-silicate complex in weathered granite. *Clay Minerals*, 16, 261–278. (2) Wilson, M.J., J.D. Russell, J.M. Tait, D.R. Clark, and A.R. Fraser (1984) Macaulayite, a new mineral from north-east Scotland. *Mineral. Mag.*, 48, 127–129. (3) (1985) *Amer. Mineral.*, 70, 1330 (abs. refs. 1 and 2).