Crystal Data: Monoclinic. *Point Group*: 2/m. As tapering tabular to prismatic crystals to 0.11 mm. *Twinning*: Structure is twinned and incommensurately modulated ($q = 0.718(4)a^{*+} 0.280(2)c^{*}$).

Physical Properties: *Cleavage*: One excellent set. *Tenacity*: Brittle. *Fracture*: Uneven. Hardness = ~ 2.5 D(meas.) = n.d. D(calc.) = 4.61 Bright yellow-green fluorescence under SW UV.

Optical Properties: Translucent. *Color*: Yellow to orange-yellow. *Streak*: Pale yellow. *Luster*: Vitreous.

Optical Class: Biaxial (-). $\alpha = 1.716(4)$ $\beta = 1.761(4)$ $\gamma = 1.767(4)$ 2V(calc.) = 42.2°

Cell Data: Superspace Group: $X2/m(\alpha 0\gamma)0s$ with $X = (0, \frac{1}{2}, 0, \frac{1}{2})$. $a = 9.8337(3) \ b = 15.0436(5) \ c = 14.2055(6) \ \beta = 108.978(3)^{\circ} \ Z = 4$

X-Ray Diffraction Pattern: Near the Radium Hill mine, South Australia. 7.450 (100), 9.175 (39), 3.067 (33), 3.365 (31), 3.255 (31), 3.209 (28), 3.554 (20)

Chemistry:		(1)
	BaO	9.88
	CaO	0.12
	Al ₂ O ₃	0.14
	UO ₃	62.80
	MoO ₃	21.56
	P_2O_5	0.15
	H ₂ O	[7.99]
	Total	102.64

(1) Near the Radium Hill mine, South Australia; average electron microprobe analysis supplemented by IR spectroscopy, H_2O calculated for charge balance; corresponds to $Ba_{0.87}Ca_{0.03}Al_{0.04}U_{2.97}Mo_{2.02}P_{0.03}O_{22}H_{11.99}$.

Mineral Group: As crusts on granite as a weathering product of baryte and primary U and Mo minerals by oxidizing groundwater.

Association: Baryte, metatorbernite, phurcalite, kaolinite.

Distribution: From 4 km northwest of the Radium Hill mine, South Australia.

Name: For its essential chemical elements: *ba*rium, *u*ranium, and *molybdenum*.

Type Material: South Australian Museum, Adelaide, South Australia (G34697).

References: (1) Elliott, P., J. Plášil, V. Petříček, J. Čejka, and L. Bindi (2019) Twinning and incomensurate modulation in baumoite, Ba_{0.5}[(UO₂)₃O₈Mo₂(OH)₃](H₂O)_{~3}, the first natural Ba uranyl molybdate. Mineral. Mag., 83, 507-514.