American Mineralogist, Volume 89, pages 721–724, 2004

Coutinhoite, a new thorium uranyl silicate hydrate, from Urucum mine, Galiléia, Minas Gerais, Brazil

Daniel Atencio,[1,*] Flávio M.S. Carvalho,[1] and Paulo A. Matioli[2]

[1]Instituto de Geociências, Universidade de São Paulo, Rua do Lago, 562, 05508-080 São Paulo, SP, Brazil
[2]Museu Jobas de Ciências Naturais "José Bonifácio de Andrada e Silva," Rua Martim Afonso 24, Biquinha, 11310-010 São Vicente, SP, Brazil

Abstract

The new mineral coutinhoite, ideally $Th_xBa_{(1-2x)}(H_2O)_y(UO_2)_2Si_5O_{13}\cdot H_2O$, with $0 \le x \le 0.5$ and $0 \le y \le (2 + x)$, occurs as a secondary hydrothermal mineral in the Córrego do Urucum granitic pegmatite, Lavra Urucum, Galiléia Co., Minas Gerais, Brazil. Coutinhoite is intimately associated with weeksite, phosphuranylite, meta-uranocircite, and uranocircite on muscovite and microcline. The mineral forms irregular aggregates with very small curved scales, flaky crystals, up to 10 μm long and with a thickness up to about 0.5 μm. Coutinhoite is transparent to translucent and displays a waxy to silky luster; color and streak are yellow. It is non-fluorescent. The hardness is less than 2. It is brittle. Calculated density is 3.839 g/cm^3. Coutinhoite is biaxial negative, α 1.620(3), β 1.627(3), γ 1.629(3), $2V_{meas.} = 40(5)°$, $2V_{calc.} = 56.1°$, dispersion $r < v$ strong, orientation $Y = \mathbf{c}$. Pleochroism is $Z > Y$, X yellow. The empirical formula (based on Si + P = 5) is $(Th_{0.30}Ba_{0.19}K_{0.07}Ca_{0.04})_{\Sigma 0.60}(UO_2)_{2.00}(Si_{4.92}P_{0.08})_{\Sigma 5.00}O_{12.91}\cdot 2.86H_2O$. The mineral is orthorhombic, probable space group *Cmmb* (67). Cell parameters were refined from the powder data: a 14.1676(9), b 14.1935(9), c 35.754(2) Å, $V = 7189.7(2)$ Å^3, and $Z = 16$. It is probably isostructural with weeksite. Both the description and name were approved by the CNMMN-IMA (Nomenclature Proposal 2003-025).