Kamotoite-(Y) \( Y_2\text{U}^{6+}(\text{CO}_3)_3\text{O}_{12} \cdot 14.5\text{H}_2\text{O} \)

Crystal Data: Monoclinic, pseudo-orthorhombic. \( \text{Point Group: } 2/m \). As wedge-terminated bladed crystals, to 2 cm, striated perpendicular to elongation [100], and as crusts. Twinning: By reflection on \{001\}, common.

Physical Properties: Cleavage: \{001\} and \{010\}, good. Tenacity: Sectile. Hardness = n.d. \( D(\text{meas.}) = 3.93 \) \( D(\text{calc.}) = 3.94 \) Radioactive.

Optical Properties: Transparent to translucent. Color: Bright lemon-yellow. Luster: Vitreous. Optical Class: Biaxial (-). Pleochroism: \( X = \) colorless; \( Y = \) pale yellow-green; \( Z = \) bright yellow. Orientation: \( X = b \); \( Z = a \); \( Y \wedge c = 25^\circ \). Absorption: \( Z > Y > X \). \( \alpha = 1.604(2) \) \( \beta = 1.667(2) \) \( \gamma = 1.731(3) \) 2V(meas.) = n.d. 2V(calc.) = 87\(^\circ\)

Cell Data: \( \text{Space Group: } P2_1/\text{a} \). \( a = 21.22(1) \) \( b = 12.93(1) \) \( c = 12.39(1) \) \( \beta = 115.3(1)^\circ \) \( Z = 4 \)

X-ray Powder Pattern: Kamoto mine, Congo. 6.48 (100), 8.49 (80), 3.054 (60), 3.49 (40), 2.762 (40), 2.132 (40b), 1.749 (40)

Chemistry:

\[
\begin{align*}
\text{\( \text{Chemistry: } \) } &
\begin{array}{ll}
\text{UO}_3 & 63.39 \\
\text{Y}_2\text{O}_3 & 6.19 \\
\text{Nd}_2\text{O}_3 & 2.36 \\
\text{Sm}_2\text{O}_3 & 1.91 \\
\text{Gd}_2\text{O}_3 & 2.10 \\
\text{Dy}_2\text{O}_3 & 1.64 \\
\text{CO}_2 & 7.24 \\
\text{H}_2\text{O} & 14.30 \\
\end{array}
\end{align*}
\]

Total \( 99.13 \)

(1) Kamoto mine, Congo; by electron microprobe, average of 19 analyses on several specimens; \( \text{CO}_2 \) by chromatography, \( \text{H}_2\text{O} \) taken as loss on ignition less \( \text{CO}_2 \) on separate samples; corresponds to \( (\text{Y}_{1.00}\text{Nd}_{0.26}\text{Gd}_{0.22}\text{Sm}_{0.20}\text{Gd}_{0.16})_2=1.84\text{U}_{4.07}(\text{CO}_3)_{3.02}\text{O}_{11.95} \cdot 14.55\text{H}_2\text{O} \).

Occurrence: Formed in the oxidized zone above a uranium-bearing \( \text{Cu–Co} \) deposit.

Association: Uraninite, uranophane, curite, schoepite, becquerelite, rutherfordine, kasolite, soddyite, schulingite-(Nd), astrocyanite-(Ce), shabaite-(Nd), françoisite-(Nd), masuyite, malachite.

Distribution: From the Kamoto mine, near Kolwezi, Katanga Province, Congo (Shaba Province, Zaire).

Name: For the occurrence at the Kamoto mine, Congo (Zaire), and its \textit{yttrium} content.

Type Material: Royal Museum of Central Africa, Tervuren, Belgium, RMG14025, RMG14350; National Museum of Natural History, Washington, D.C., USA, 163786.