

Mellite

$\text{Al}_2[\text{C}_6(\text{COO})_6] \cdot 16\text{H}_2\text{O}$

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Crystal Data: Tetragonal. *Point Group:* $4/m\ 2/m\ 2/m$. Crystals are dipyrmidal {023}, also prismatic, elongated along [001], modified by {001}, {010}, {113}, to 7.5 cm; as nodules and coatings, fine-grained massive.

Physical Properties: *Cleavage:* {023}, indistinct. *Fracture:* Conchoidal. *Tenacity:* Slightly sectile. Hardness = 2–2.5 $D(\text{meas.}) = 1.64$ $D(\text{calc.}) = 1.65$ May fluoresce pale yellow to blue under SW and LW UV.

Optical Properties: Transparent to translucent. *Color:* Honey-yellow, deep red, pale shades of red, brown, gray, white; colorless to pale yellow in transmitted light. *Streak:* White. *Luster:* Resinous to vitreous.

Optical Class: Uniaxial (-), may be anomalously biaxial. *Pleochroism:* Weak; *O* = yellowish brown; *E* = yellow. *Orientation:* $X = c$. $\omega = 1.539$ $\epsilon = 1.511$ $2V(\text{meas.}) = \text{Small}$.

Cell Data: *Space Group:* $I4_1/acd$. $a = 15.53(1)$ $c = 23.19(1)$ $Z = 8$

X-ray Powder Pattern: Artern, Germany.

7.99 (100), 4.23 (70), 5.80 (55), 5.16 (40), 3.46 (30), 3.39 (30), 2.985 (25)

Chemistry:

| | (1) | (2) |
|-------------------------|---------|--------|
| C_4O_3 | 42.6 | 42.48 |
| Al_2O_3 | 15.1 | 15.03 |
| H_2O | [42.3] | 42.49 |
| Total | [100.0] | 100.00 |

(1) Artern, Germany; recalculated from a partial analysis C 8.01%, Al 21.3%, corresponding to $15.7\text{H}_2\text{O}$ by difference. (2) $\text{Al}_2[\text{C}_6(\text{COO})_6] \cdot 16\text{H}_2\text{O}$.

Occurrence: An uncommon secondary mineral in brown coal and lignite deposits, aluminum typically derived from clay.

Association: n.d.

Distribution: In Germany, from Artern, Thuringia, and near Bitterfeld, Saxony-Anhalt. At Lušice, near Bílina, Valchov, and Boskovice, Czech Republic. Large crystals from the Csordakút mine, Tatabánya, Hungary. From Malevka, Bogoroditsk district, southeast of Tula, Russia.

Name: From the Greek for *honey*, in allusion to the color.

References: (1) Palache, C., H. Berman, and C. Frondel (1951) Dana's system of mineralogy, (7th edition), v. II, 1104–1105. (2) Giacobozzo, C., S. Menchetti, and F. Scordari (1973) The crystal structure of mellite. *Acta Cryst.*, 29, 26–31. (3) Jobbins, E.A., G.A. Sergeant, and B.R. Young (1965) X-ray and other data for mellite. *Mineral. Mag.*, 35, 542–544.