

## **MELLITE (Al<sub>2</sub>C<sub>12</sub>O<sub>12</sub> • 16H<sub>2</sub>O) FROM CSORDAKÚT MINE, BICSKE, HUNGARY: A NEW MINERAL FOR THE CARPATHIAN–PANNONIAN REGION**

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Mellite, a rare organic mineral (Al<sub>2</sub>C<sub>12</sub>O<sub>12</sub> • 16H<sub>2</sub>O) was found in the Eocene coal mine Csordakút, Bicske (near Tatabánya), Hungary. The aim of the present study is the mineralogical characterisation of the Csordakút mellite.

The mineral occurs in euhedral, well developed pyramidal crystals up to 12 cm. Cm size crystals and parallel intergrowth of them are common. D<sub>m</sub> = 1.6108(1) g/cm<sup>3</sup>. Most of the crystals are translucent, wax or honey yellow, but several fully transparent, colourless crystals were also found. Black colour, caused by coal inclusions, was also observed.

Based on morphological observations, two varieties can be distinguished. The most common is the perfect {111} dipyramid, rarely in combination with the subordinated {100} and/or {001} crystal forms. Less frequent are the distorted crystals, having two types of distortion: 1) platy crystals, where the plates form according to one of the faces of {111}, and 2) elongated, columnar crystals, where [111] is the axis of elongation. The distorted crystals are of the same crystal form(s) as the perfect ones. It is worth to mention that most of the transparent, colourless crystals belong to the distorted platy type.

No full chemical analysis has been performed on the mellite from Csordakút. We determined the water and the Al content by thermal analysis (combined DTA, TG and DTG analysis, both in air and in N<sub>2</sub> atmosphere, up to 1273 K). Our results support the data of GIACOVAZZO *et al.* (1973), who reduced the amount of water in the formula from 18 to 16. We hoped to find correlation between the colour and the trace elements (determined by AAS), but no significant differences could be found between the colourless and yellow samples (e.g. Fe 167 and 222 mg/kg, resp.). Unit cell parameters (XPD): c<sub>0</sub> = 23.12(2), a<sub>0</sub> = 15.34(2), D<sub>calc</sub> = 1.615 g/cm<sup>3</sup>. Systematic extinctions (based on single crystal patterns) confirm the I4<sub>1</sub>acd space group.

Mellite occurred in altered zones close to the bottom of the coal bed. Based on the heavily acidic environment (we measured pH down to 2 in water in the mine at places close to the “mellite adit”), we assume that mellite was formed by the interaction of organic acids and clay minerals present in the coal.

### Reference

GIACOVAZZO, C., MENCHETTI, S. & SCORDARI, F. (1973). *Acta Cryst.*, B29: 26–31.