

## **First reported sedimentary occurrence of berlinite (AlPO<sub>4</sub>) in phosphate-bearing sediments from Cioclovina Cave, Romania**

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### **ABSTRACT**

This paper describes the first reported occurrence of berlinite (AlPO<sub>4</sub>) formed entirely under sedimentary conditions. Berlinite appears as grayish or colorless fine crystals in vacuoles and along cracks in heavily compacted, phosphate-rich sediments within the Cioclovina Cave in Romania. The X-ray powder diffraction pattern and the hexagonal unit-cell of the Cioclovina berlinite specimen compare well with other published determinations. The lattice parameters are  $a = 4.94(4)$ ,  $c = 10.87(1)$  Å,  $V = 230.1(3)$  Å<sup>3</sup>. Microprobe analyses confirmed a nearly ideal formula for berlinite. In situ guano combustion is responsible for the transformation of taranakite and for the dehydration of variscite into berlinite. Berlinite was successfully synthesized from these two minerals at atmospheric pressure and temperatures ranging from 350 to 600 °C.