

Occurrence of Spherical Halloysite in Bituminous Coals of the Sydney Basin, Australia

Colin R. Ward and F. Ivor Roberts

Department of Applied Geology, University of New South Wales P.O. Box 1, Kensington, New South Wales, 2033 Australia

Abstract: Spherical halloysite aggregates have been identified for the first time in mineral matter isolated from bituminous coals. The spherules, found in Permian coals of the Sydney basin, New South Wales, range from 0.4 to 0.6 μm in diameter and have a delicate ring-like structure that helps to confirm the halloysite identification. They appear from their location to be related to influxes of pyroclastic debris, either directly or from nearby soils, into the original peat accumulation. Analytical electron microscopy indicates higher proportions of Si and Fe than coexisting particles of hexagonal platy kaolinite, and electron diffraction reveals a typical disordered halloysite structure. The aggregates are larger than those normally reported in soils, and comparison to growth rates in soils suggests development over a significantly longer time than that expected for accumulation of the host coal seams. The buckled structure in the ring-like pattern and the related crude polyhedral outlines probably reflect shrinkage with dehydration during the coalification process, but it may also be due to the different sample preparation techniques.

Key Words: Coal • Energy-dispersive X-ray spectroscopy • Halloysite • Morphology • Sphere • Transmission electron microscopy

Clays and Clay Minerals; October 1990 v. 38; no. 5; p. 501-506; DOI: [10.1346/CCMN.1990.0380506](https://doi.org/10.1346/CCMN.1990.0380506)

© 1990, The Clay Minerals Society
Clay Minerals Society (www.clays.org)
