

Gonnardite: Re-examination of holotype material and discreditation of tetranatrolite

G. ARTIOLI^{1,*} AND E. GALLI²

¹Dipartimento di Scienze della Terra, Università di Milano, Via Botticelli 23, I-20133 Milano, Italy

²Dipartimento di Scienze della Terra, Università di Modena, Via S. Eufemia 19, I-41100 Modena, Italy

ABSTRACT

Gonnardite is a fibrous zeolite. Its chemical variability and the frequent close association with thomsonite and other zeolites have made the chemical and crystal structural definition of the mineral difficult. Only recently was the structural relationship to natrolite confirmed unambiguously by single crystal X-ray diffractometry. The present chemical and crystallographic study re-examines gonnardite type material from Puy-de-Dôme, France (British Museum specimen no. BM1930-166), to define its relationship to tetranatrolite. Materials from the deposited holotype specimens and from samples collected by us in the type locality were characterized by electron microprobe analysis and thermogravimetry, and the crystal structure was refined from X-ray powder data using the Rietveld method. We conclude that gonnardite has a large chemical variability, and its chemical composition broadly covers the join between natrolite and thomsonite. Its framework topology [NAT] is common with natrolite, tetranatrolite, mesolite, and scolecite. However, whereas natrolite, mesolite, and scolecite have well-defined compositional fields and unique crystallographic parameters, no valid chemical or crystallographic parameter can be used to distinguish gonnardite from tetranatrolite, unless based on Si/Al ratio in the framework. Although the occurrences and mineral associations seem to indicate that tetranatrolite commonly has a different genesis to gonnardite, this does not discriminate species. Because of priority, it is proposed that gonnardite be retained as a valid mineral species and tetranatrolite be discredited.