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# The Definition and Nomenclature of Halloysites

G. J. Churchman\* and R. M. Carr

Chemistry Department, University of Otago, Dunedin, New Zealand

\* Present address: Soil Bureau, Department Of Scientific and Industrial Research, Lower Hutt, New Zealand.

**Abstract:** This review of the literature shows that there have been many attempts to modify or revise the original definition of halloysites as distinguished from kaolinites, which was based on the greater water content of the halloysites. In general; these various attempts have arrived at definitions of halloysites as distinguished from kaolinites that are based on one or more particular instrumental or chemical techniques. Further investigations with almost all of these techniques have shown the apparently clear distinctions of this kind to be misleading. All such instrumentally—or chemically—based definitions were shown to either complicate and confuse the distinction between halloysites and kaolinites or to provide only empirical and subtle distinctions. It is concluded that only the original definition, with slight adaptations, enables clear and unambiguous distinctions to be made between halloysites and kaolinites. It is noted, however, that a distinctive structure for halloysite has been postulated as a result of electron diffraction studies. Further studies of this kind could well establish such a structure as being definitive of the mineral species.

The literature also reveals a long-standing disagreement over the nomenclature of different forms of halloysite and particularly over the nomenclature of and distinction between the two forms of halloysite at the extreme ends of the hydration series. An analysis of experimental studies of the relationship between these two and other hydration states of halloysite reveals that forms of halloysite with all possible interlayer water contents between 0 and 2 molecules H<sub>2</sub>O per Al<sub>2</sub>Si<sub>2</sub>O<sub>5</sub>(OH)<sub>4</sub> unit cell may exist and that the two end members of the hydration series may not be seen as distinct phases. The fully dehydrated halloysite is the only thermodynamically stable form of the mineral. A nomenclature system which was proposed by MacEwan in 1947 is consistent with these results. This system, amended only by the exclusion of the unnecessary term ' metahalloysite' should therefore be adopted in all studies of halloysites.

*Clays and Clay Minerals*; November 1975 v. 23; no. 5; p. 382-388; DOI: [10.1346/CCMN.1975.0230510](https://doi.org/10.1346/CCMN.1975.0230510)

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