

HUNGARIAN INVESTIGATIONS ON THE “ZEMPLÉNI” ILLITE

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In recent papers dealing with the mineralogy of mixed-layer illite/smectites, a standard material called “Zempleni illite” frequently occurs (Środoń 1984; Ahn and Buseck 1990; Veblen et al. 1990; Reynolds 1992; Środoń et al. 1992). These papers mention that the material is a hydrothermal clay from Hungary provided by J. Środoń. Seemingly little is known about former Hungarian investigations carried out on this material. Most of these investigations were published only in local journals or conference reports, mainly in Hungarian. There are, however, a few papers that are at least theoretically accessible also for a foreign reader.

As for the locality, it seems to be certain that the locality of the so-called “Zempleni” illite is Füzérradvány. The term “Zempleni”—or, with correct orthography: “Zempléni”—is the name of the mountain range that includes the locality. This mountain range is situated in northeast Hungary and is built almost exclusively of Tertiary volcanics. The term “Zempléni Mountains” is used mostly in the geographic and touristic literature: in geology, the synonymous term “Tokaj Mountains” is used (referring to the center of the famous wine-growing district situated at the southern end of the range). Füzérradvány is a very small village and the nearest town in the district is Sárospatak. This is why in some old publications the illite from Füzérradvány was described as “sárospatakite” or “sárospatite”. In the Tokaj Mountains, no other important locality of illite occurs; however, there are interesting occurrences of other hydrothermal clay minerals and zeolites (Mátyás 1979a, 1979b; Nemez 1981). The geology of the Füzérradvány locality was described in detail in Mátyás (1979b).

The first important paper published on the mineralogy of Füzérradvány illite was that of Nemez and Varju (1970). They described the history of investigations (pioneer studies by Maegdefrau and Hofmann, Sedlecky, Grim and Bradley), the mode of geological occurrence (with a geological section) and the basic mineralogy, including X-ray diffractometric, thermal and chemical investigations. They recognized the interstratified nature of the material and estimated the proportion of the expandable layers by the methods available in that time to 25–27%. They found a good

relation between layer charge and K contents of these minerals.

Nemez mentioned the Füzérradvány “illite” several times in his book (1981, p 336–343 and 464–469). He recognized the 1M polytypic modification and published transmission electron microscopy (TEM) photographs. He discussed the origin in the chapter on hydrothermal clays.

The mixed-layer nature of the material was more precisely determined in a more recent paper by Szegedi (1988). She used the direct Fourier transform method and the graphs published by Środoń (1980) and found the proportion of the expandable layers to be in the range 10–13% and the ordering of ISII type.

Dódy (1985) approximated to some extent the “fundamental particle” theory (Nadeau et al. 1984) on the basis of his high-resolution TEM (HRTEM) investigations.

The K/Ar age of the rhyolitic volcanism that provided the starting material for the hydrothermal alteration is in the range of 10 to 15 Ma (Pécskay et al. 1986, 1987).

The locality is still mined. Untreated, roughly ground raw material taken from the processing plant of E. Mátyás at Mád is available in limited amounts from the author of the present Note.

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