
Particle Shape versus Coherent Scattering Domain of Illite/Smectite: Evidence from HRTEM of Dolná Ves Clays

Vladimír Šucha¹, Jan Šrodoň², Françoise Elsass³ and William J. McHardy⁴

¹ Department of Geology of Mineral Deposits, Comenius University, Mlynská dolina G, 842-15 Bratislava, Slovakia

² Institute of Geological Sciences PAN, Senacka 1, 31-002 Kraków, Poland

³ Station de Science du Sol INRA, Route de St-Cyr, 78000 Versailles, France

⁴ The Macaulay Land Use Research Institute, Craigiebuckler, Aberdeen AB92QJ, UK

Abstract: Fundamental particle thickness measurements of Dolná Ves hydrothermal illite/smectite (I/S) samples confirmed earlier findings regarding the content of fixed cations in illite interlayers (ca. $0.9/\text{O}_{10}(\text{OH})_2$). The distributions of fundamental particles and mixed-layer crystals of a given sample are internally consistent. In samples dominated by bilayer fundamental particles, mixed-layer crystals most often contain even numbers of layers. The expandabilities measured by XRD are much higher than so-called minimum expandabilities obtained from HRTEM measurements. This discrepancy is explained by assuming that the coherent scattering domains of Dolná Ves clays do not correspond to natural mixedlayer crystals but are thicker, probably due to parallel association of crystals on the oriented XRD slide. This tendency to produce intercrystal contacts is probably related to the unusually large *ab* dimensions of crystals of Dolná Ves clays.

Key Words: Coherent scattering domain • Fundamental particle • HRTEM • Illite/Smectite • Mixed-layer crystal

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