
The Effect of Mechanical Treatment on the Crystal Structure and Thermal Behavior of Kaolinite

Éva Kristóf¹, A. Zoltán Juhász¹ and István Vassányi²

¹ Department of Silicate Chemistry and Technology, University of Veszprém P.O. Box 158, H-8201 Veszprém, Hungary

² Department of Mineralogy, University of Veszprém, P.O. Box 158 H-8201 Veszprém, Hungary

Abstract: The destruction of the crystal structure of kaolinite caused by mechanical forces was investigated by X-ray diffraction, thermal analysis, infrared spectroscopy, and specific surface area determination. Attention was also directed to the change of thermal reactions of milled kaolinite. Grinding experiments for 5 min, 10 min, and 1, 2, 4, 6, and 10 h were carried out in an AGO I planetary mill. After 1 h of grinding, the crystalline order of kaolin is destroyed; but the amorphization continues in the course of prolonged grinding. Grinding for 1 h produces a favorable state for forming mullite-type crystals after heating even at 1000° C.

Key Words: Amorphization • Crystal structure • Grinding • Kaolinite • Mechanochemistry • Thermal behavior

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