Mechanism of Acid Activation of Magnesic Palygorskite

F. Gonzalez, C. Pesquera, I. Benito, S. Mendioroz and J. A. Pajares

Departamento de Química, Universidad de Cantabria Avda. de los Castros s/n, 39005-Santander, Spain
Instituto de Catálisis y Petroleoquímica, C.S.I.C. Serrano 119, 28006-Madrid, Spain

Abstract: This paper compares the texture of palygorskite after acid leaching with that of the product after extraction silica is removed. These effects were evaluated on the basis of nitrogen adsorption- desorption and mercury penetration porosimetry. Acid leaching at reflux temperature with 2 N HCl resulted in an increase in surface area from 138 to 399 m^2/g, due to a partial (~50%) dissolution of the octahedral sheet and the creation of microporosity. This microporosity disappeared if the silica generated by the leaching was removed. The surface area also decreased from 399 to 214 m^2/g, and the pore volume decreased from 0.538 to 0.507 cm^3/g. The microporosity must therefore have been due to texture development in the generated silica.

Key Words: Acid leaching • Palygorskite • Porosity • Silica • Surface area

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