

# Turkish Journal of Chemistry

Turkish Journal

The Effect of Acid Activation on Some Physicochemical Properties of a Bentonite

of

Chemistry

Müşerref ÖNAL, Yüksel SARIKAYA, Tülay ALEMDAROĞLU  
Ankara University, Faculty of Science, Department of Chemistry  
06100 Tandoğan, Ankara-TURKEY

İhsan BOZDOĞAN  
Eczacıbaşı Ceramic Industry, Kısıklı Cad. 1, Altunizade,  
81190 Üsküdar, İstanbul-TURKEY

 [Keywords](#)  
[Authors](#)



[chem@tubitak.gov.tr](mailto:chem@tubitak.gov.tr)

[Scientific Journals Home  
Page](#)

**Abstract:** A white calcium bentonite (CaB) from the K\{u}tahya region/Turkey was activated by heating it for 6 hours at 97°C in H<sub>2</sub>SO<sub>4</sub> solution. The mass percentage of H<sub>2</sub>SO<sub>4</sub> in the bentonite-acid mixture was varied from 0 to 70%. The chemical analysis (CA), cation exchange capacity (CEC), differential thermal analysis (DTA) curves and X-ray diffraction (XRD) patterns of the prepared samples were determined. The specific surface area (A) and the specific micropore-mesopore volume (V) were calculated respectively from the adsorption and desorption data of N<sub>2</sub> obtained at liquid N<sub>2</sub> temperature. How the calcium montmorillonite (CaM) layers in the CaB were decomposed during the preservation of the crystal structure is discussed by using CA, CEC, DTA and XRD data. The variations in the porosity of CaB during acid activation were related to the variations in the crystal structure and are discussed. Although the values of A and V were 43 m<sup>2</sup>g<sup>-1</sup> and 0.107cm<sup>3</sup>g<sup>-1</sup> respectively for the original bentonite, these values reached a maximum and were 134 m<sup>2</sup>g<sup>-1</sup> and 0.295 cm<sup>3</sup>g<sup>-1</sup> respectively after activation by 40% H<sub>2</sub>SO<sub>4</sub>.

**Key Words:** Acid Activation, Bentonite, Cation Exchange Capacity, Pore Volume, Surface Area.

---

Turk. J. Chem., **26**, (2002), 409-416.

Full text: [pdf](#)

Other articles published in the same issue: [Turk. J. Chem.,vol.26,iss.3.](#)