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Abstract

Hydrogen adsorption capacities of natural and salt treated zeolite

Meryem Akbelen[1]*, Cağatay Ezber[2]

[1]*Department of Physics, Faculty of Science, Eskişehir Technical University, 26470, Eskisehir, Turkey*

[2]*Graduate School of Science, Eskişehir Technical University, 26470, Eskisehir, Turkey*

Abstract:

In this study, the hydrogen adsorption isotherms of clinoptilolite-mordenite-rich tuff supplied from Turkey and their exchanged forms (K+, Na+ and Ca2+) were obtained at pressures up to 100 kPa and 77 K. Zeolites are porous, crystalline, hydrated aluminosilicates with the framework structure consisting of AlO4 and SiO4 tetrahedra. These are linked to each other by sharing all of the oxygens to form the zeolite structure containing channels. Hydrogen is the simplest and most abundant element in nature; it will probably be the most significant energy source in the future if it is stored more economically and safely. Zeolite samples was ground and sieved to obtain < 45 μm fractions. These zeolite fractions were exchanged with K+, Na+ and Ca2+ to determine the influence of the exchangeable cation on their hydrogen sorption behavior. The chemical composition of natural and salt-treated zeolite samples was obtained from the powder samples that were fused with lithium tetraborate using an XRF device, Rigaku ZSX Primus.Powder XRD patterns were recorded on powdered samples with a Rigaku RINT-2200 diffractometer using Cu Kα radiation and operated in the 2θ range between 3o and 70o, with a step size of 0.02o. H2 adsorption capacities of all samples were obtained by Quantachrome Autosorb-1C gas adsorption analyser.

Biography:

Cağatay Ezber studies Physics Master of Science at Eskisehir Technical University

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