



Modified Natural Zeolite into Hydrophilic Zeolite for Desalination of Brackish Water and The effect of Long Time of Stirring

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Abstract : Desalination of brackish water using modified natural zeolite (MNZ) that had hydrophilic character and the effect of long time of stirring has been studied. The MNZ was synthesized by destructing the natural zeolite with 6M HCl solution, followed by treating with Al(OH)₃, CTAB and distilled water. The mixture was regulated to pH of 12. The mixture was then poured into a reactor for hydrothermal process at 140 °C for 24 h. The dealumination of natural zeolite was characterized using X-Ray Fluorescence spectrometry(XRF) and the MNZ was characterized using Fourier Transform Infra Red, X-Ray Diffraction, and surface area analyzer. This research was conducted in batch with variation of adsorbent weight and long time of stirring. The Absorption of brackish water using MNZ was carried out in the variation of ratio of zeolite (g) to brackish water (mL) in Batch method. The filtrate results of absorption were analyzed using Atomic Absorption Spectrophotometry (Na⁺ contents) and Mohr Method (Cl⁻ and NaCl contents). The resulted showed that the dealumination of natural zeolite had Si content of 39.28%, and Al of 3.27 %. The results of measurements with XRD produced a different form of chromatogram and type of zeolite. The dominant mineral was faujasite. The MNZ had Surface area, total pore volume and pore diameter of MNZ zeolite were 285.538m²/g; 0.303 cm³/g; and 7.892 nm respectively. The absorption results of Na⁺ and NaCl contents in brackish water were 93,7 %, and 95.9 %at ratio of 2.5 g zeolite to 50 mL of brackish water that was obtained at 2 h of long time of stirring.

Keywords : natural zeolite, modified, absorption, desalination, brackish water.

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