

## Utilization of Modified Natural Zeolite using Some Treatments For Reduction of $\text{Na}^+$ , $\text{K}^+$ , $\text{Cl}^-$ And NaCl Contents in Brackish Water

Alex A.Lepa<sup>1\*</sup>, Ilham Salim<sup>2</sup>, Frans P. Kafiar<sup>3</sup>

<sup>1</sup>Department of Chemistry Education, Faculty of Teacher Training and Education, Cenderawasih University, Jayapura, Indonesia

<sup>2</sup>Department of Chemistry Faculty of Science and Mathematics, Cenderawasih University, Jayapura, Indonesia

<sup>3</sup>Department of Chemistry Education, Faculty of Teacher Training and Education, Cenderawasih University, Jayapura, Indonesia

**Abstract :** Absorption of brackish water using modified natural zeolite has been done. There were 3 types of natural zeolite modification treatment. Firstly, the natural zeolite was only heated at temperature of 120 °C. Secondly, dealumination of natural zeolite with 6M HCl then dried at 120 °C. Thirdly, dealumination of natural zeolite with 6M HCl, then followed by treating with NaOH,  $\text{AlCl}_3 \cdot 6\text{H}_2\text{O}$ , CTAB and distilled water (made hydrophilic zeolite). The mixture was regulated to pH of 12. Next, poured into a reactor for hydrothermal process at 140 °C for 24 h. The results of the dealumination of natural zeolite was characterized by X-ray Fluorescence and the modified natural zeolites were characterized using X-Ray Diffraction, and surface area analyzer. The Absorption of brackish water using modified natural zeolite was carried out in the variation of ratio of zeolite (g) to brackish water (mL) of 0.5 : 50; 1 : 50; 1.5 : 50; 2 : 50 and 2.5 : 50 respectively. The filtrate results of absorption were analyzed using Atomic Absorption Spectrophotometry ( $\text{Na}^+$  and  $\text{K}^+$  contents) and Mohr Method ( $\text{Cl}^-$  and NaCl contents). The result showed that the dealumination of natural zeolite had Si content of 39.28%, and Al content of 3.27 %. The results of measurements with XRD produced a different form of chromatogram and type of zeolite. The results of measurements with Surface area analyzer obtained increase in surface area, pore volume and pore diameter from natural zeolite to modified natural zeolite with the addition of  $\text{AlCl}_3 \cdot 6\text{H}_2\text{O}$  and CTAB. The absorption results of brackish water were 58.12(NZ), 94.20(MNZ) and 90.45% (ZSNZ zeolite) respectively at ratio of 2.5 g zeolite to 50 mL of brackish water.

**Keywords :** natural zeolite, modification, absorption, brackish water.

Alex A.Lepa *et al* / International Journal of ChemTech Research, 2018,11(11): 202-210.

DOI= <http://dx.doi.org/10.20902/IJCTR.2018.111120>

\*\*\*\*\*