



## Microwave Assisted Preparation of Zirconia-Pillared Bentonite

Yeslia Utubira<sup>1\*</sup>, Karna Wijaya<sup>2</sup>, Triyono<sup>2</sup>, Eko Sri Kunarti<sup>2</sup>

<sup>1</sup>Department of Chemistry Education, Faculty of Teacher Training and Education Science, Pattimura University, Ambon 97234, Indonesia

<sup>2</sup>Chemistry Department, Faculty of Mathematics and Natural Sciences GadjahMada University, Yogyakarta 55281, Indonesia

**Abstract:** The development of zirconia-pillared bentonite has been carried out by intercalating the solution of cationic polyoxozirconium using  $ZrOCl_2$  precursor into natural bentonite was continued through radiation process using microwave of 800 watt for 10 minutes to produce metal oxide formation. The synthetic product was then characterized using XRD, XRF, FTIR, TEM and analysis of  $N_2$  adsorption/desorption. The success of pillarization process of zirconium into natural bentonite has been proved by the analysis result of XRD. The result showed that the basal spacing shifted (001) into left direction, and the reflections showed the structure of bentonite/pillared bentonite of  $2\theta=4.6^\circ, 19^\circ$  and  $25^\circ$ . In addition, the result of XRD performed new reflections of  $2\theta=31.24^\circ$  and  $35^\circ$  as the reflection of  $ZrO_2$ . Meanwhile the analysis result of XRF showed that the amount of Zr metal in  $ZrO_2$ -Bentonite was found at 8.38%. Moreover, the acidity was analyzed using FTIR in which it showed the increasing trend both in the acidity in  $ZrO_2$ -Bentonite material compared to bentonite, and the volume of total pore of 0.061 into  $0.063\text{ cm}^3\text{g}^{-1}$ .

**Keywords :** Bentonite, Zirconium, Intercalation, Pillarization, Microwave radiation.

Yeslia Utubira *et al* /International Journal of ChemTech Research, 2016,9(4),pp 475-482.

\*\*\*\*\*