



# Characterization of Natural Zeolite from Gunung Kidul, Yogyakarta, Indonesia and Its Modification, and Its Use to Reduce the Contamination of Zinc in Waste Water

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**Abstract:** This study was aimed to characterize the natural zeolite from Gunung Kidul, Yogyakarta, Indonesia and its-acid modification, evaluate the time required to reach equilibrium in the adsorption process of  $Zn^{2+}$ , measure the maximum concentration of the ion that could be adsorbed per unit mass of adsorbent (adsorption capacity of the adsorbent). It was shown from the data and the figure that the adsorption equilibrium was attained after 60 minutes of time with the adsorption capacity of  $4.1 \pm 0.03$  mg/g. From the infrared spectra, it was clear that treatment with HCl 1 N did not change the functional group of the zeolite used. Comparing X-ray diffraction pattern of natural zeolite used and that of standard zeolite, it could be stated that the natural zeolite from Gunung Kidul, Yogyakarta, Indonesia, is zeolite of mordenite type. It was also demonstrated from the X-ray diffraction patterns that treatment with HCl 1 N did not destroy the crystalline structure of zeolite.

**Key words:** Natural zeolite, adsorption equilibrium, adsorption capacity, mordenite-type.