ABSTRAK

PENGARUH SUHU KALSINASI (450 ^{o}C, 550 ^{o}C, DAN 650 ^{o}C) TERHADAP STRUKTUR DAN LUAS PERMUKAAN SPESIFIK ZEOLIT BERBASIS SILIKA SEKAM PADI

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Telah dilakukan penelitian untuk mengetahui pengaruh suhu kalsinasi terhadap struktur kristal dan luas permukaan spesifik zeolit berbasis silika sekam padi. Silika diperoleh dari sekam padi menggunakan teknik ekstraksi alkalis. Sementara, sintesis zeolit menggunakan metode sol gel dari sol silika dan sol sodium aluminat. Variasi suhu kalsinasi yang digunakan dalam penelitian ini, yaitu 450 ^{o}C, 550 ^{o}C, dan 650 ^{o}C dengan waktu tahan selama 3 jam. Karakterisasi sampel menggunakan *X-Ray Diffraction* (XRD) dan *Surface Area Analyzer* (SAA) dengan metode *Brunaur, Emmet, Teller* (BET). Hasil XRD menunjukkan bahwa zeolit telah terbentuk pada suhu 450 ^{o}C dengan munculnya fasa *gmelinite,* dan terbentuk fasa lainnya yaitu *bohmite, aluminum oxide gamma,* dan *silicon oxide hydrate* yang merupakan senyawa alumina dan silika sebagai kerangka dasar penyusun zeolit. Sementara, pada suhu 550 ^{o}C dan 650 ^{o}C hilangnya fasa *bohmite* dan fasa yang terbentuk yaitu *aluminum oxide gamma, silicon oxide hydrate,* dan *gmelinite*. Nilai luas permukaan yang diperoleh seiring kenaikan suhu kalsinasi, yaitu 216,21 m^2/g, 159,46 m^2/g, dan 149,94 m^2/g. Semakin tinggi suhu kalsinasi maka ukuran kristalit semakin meningkat, sehingga menyebabkan luas permukaan spesifik menurun.

Kata kunci: BET, silika sekam padi, ukuran kristalit, XRD, zeolit.

ABSTRACT

THE EFFECT OF CALCINATION TEMPERATURE (450 °C, 550 °C, 650 °C) ON THE STRUCTURE AND SURFACE AREA SPECIFIC ZEOLITE SILICA BASED HUSK RICE

By

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The research to determine the effect of calcination temperature on the crystal structure and specific surface area silica zeolite based rice husk was conducted. Silica was obtained from rice husk using alkaline extraction techniques. While the zeolite synthesis was obtained by sol gel method from silica sol and sodium aluminate. The samples was performed by calcination temperature variations 450 ^{o}C, 550 ^{o}C, and 650 °C with holding time of 3 hours. Characterization samples using X-Ray Diffraction (XRD) and Surface Area Analyzer (SAA) with the method Brunaur, Emmet, Teller (BET). The XRD results showed that the zeolite had been formed by the gmelinite phase at temperature of 450 °C and had formed bohmite, aluminum oxide gamma, and silicon oxide hydrate phase which is a compound of alumina and silica zeolite as the basic framework constituent. Meanwhile, at temperature of 550 °C and 650 °C has loss bohmite phase and had formed aluminum oxide gamma, silicon oxide hydrate, and gmelinite phase. The spesific surface area values with increase calcination temperature were obtained 216.21, 159.46, and 149.94 m^2/g. The higher calcination temperature, the larger crystallite size caused the specific surface area decreases.

Keywords: BET, rice husk silica, crystallite size, XRD, zeolites.