INTISARI

PEMBUATAN DAN KARAKTERISASI KATALIS ZnO/KARBON AKTIF DENGAN METODE *SOLID STATE* DAN UJI AKTIFITAS KATALITIKNYA PADA DEGRADASI RHODAMIN B

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Katalis ZnO/Karbon Aktif (ZnO/KA) telah berhasil disintesis dengan metode *solid state.* Sintesis dilakukan dengan memvariasikan penambahan karbon aktif (KA) 2%, 5%, dan 10% terhadap massa ZnO yang digunakan dan suhu kalsinasi 400°C. Katalis yang terbentuk dikarakterisasi dengan *Fourier Transform Infra Red* (FTIR), *X-Ray Diffraction* (XRD), dan *Scanning Electron Microscopy* (SEM). Dari hasil FTIR, terlihat adanya serapan C=C yang diasumsikan berasal dari KA. Untuk hasil XRD, diketahui bahwa dengan adanya penambahan KA, tidak terlalu merubah kristalinitas dan ukuran kristal ZnO, dengan struktur kristal yaitu heksagonal (wurtzite). Gambar SEM memperlihatkan bahwa partikel-partikel ZnO menempel dan menyebar pada permukaan KA. Untuk hasil uji aktifitas katalitik, katalis ZnO/KA diujikan pada degradasi larutan rhodamin B 10 ppm dengan penyinaran sinar UV, dimana dengan semakin meningkatnya jumlah KA maka kemampuan katalitik ZnO juga meningkat, dapat disimpulkan bahwa karbon aktif dapat membantu meningkatkan peranan ZnO dalam mendegradasi rhodamin B.

***Kata kunci*:** katalis komposit, ZnO, karbon aktif, *solid state*, rhodamin B

ABSTRACT

PREPARATION AND CHARACTERIZATION OF CATALYST ZnO/ACTIVATED CARBON USING SOLID STATE METHOD AND CATALYTIC ACTIVITY TESTED ON DEGRADATION OF RHODAMINE B

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Composite catalyst ZnO/Activated Carbon (ZnO/AC) had been synthesized successfully by solid state method. Synthesis was done by varying the addition of activated carbon (AC) 2%, 5%, and 10% ZnO mass. Composite catalyst were calcinated at 400°C and characterized by FTIR (*Fourier Transform Infra Red*), XRD (*X-Ray Diffraction*), SEM (*Scanning Electron Microscopy*). Based on the results of FTIR, absorption appeared in the region wave number 1400 - 1600 cm^{-1}, which indicated stretching of C = C was assumed come from AC. From the XRD results, it was known by the addition of AC, not overly change the crystallinity and crystal size of ZnO, the crystal structure is hexagonal (wurtzite). SEM images showed AC prevented the agglomeration of ZnO that would expand the surface area of ZnO and increasedcatalytic activity of ZnO. For the results of the catalytic activity test, catalyst ZnO/AC was tested on the degradation of rhodamine B solution (10 ppm) by UV light irradiation, where the increasing number of trains the catalytic ability of ZnO also increased, it could be concluded that activated carbon can support to increase the role of ZnO in degrading rhodamine B.

***Keywords*:** composite catalyst, ZnO, activated carbon, solid state, rhodamine B