

Sintesis silika berpori dengan teknik co-micelle emulsion templating menggunakan template variasi surfaktan/akrilamida sebagai pendukung katalis = Synthesis of porous silica by co micelle emulsion templating technique using template variation of surfactant acrylamide as support catalyst

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Abstrak

[ABSTRAK

Silika berpori telah berhasil disintesa melalui teknik co-Micelle/Emulsion Templating (co-MET) dengan menggunakan template surfaktan CTAB (kationik), SDS (anionik), dan Triton X-100 (nonionik). Silika hasil sintesis dikarakterisasi menggunakan instrumen FTIR, XRD, SEM-EDS, TEM, dan BET. Hasil karakterisasi EDS menunjukkan material hasil sintesis merupakan silika murni yang hanya terdiri atas Silikon (Si) dan Oksigen (O). Silika yang dihasilkan melalui template CTAB (1,0 mM) /akrilamida mempunyai diameter pori rata-rata sebesar 1,205 nm dan luas permukaan 545,909 (m²/g); sedangkan dengan template SDS (8,2 mM) /akrilamida mempunyai diameter pori rata-rata 1,199 nm dan luas permukaan 423,280 (m²/g); dan silika dengan template TX-100 (0,24 mM)/akrilamida mempunyai diameter pori rata-rata 1,202 nm dan luas permukaan 398,263 (m²/g). Silika berpori berhasil dijadikan pendukung katalis AlCl₃ melalui teknik impregnasi. Aplikasi katalis AlCl₃/SiO₂ pada reaksi benzaldehida dengan etanol menghasilkan produk benzaldehid dietil asetal, yang telah dianalisis menggunakan GC-MS dengan komposisi 45,14%.

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<i>ABSTRACT

, Porous silica have been successfully synthesized by a technique co-Micelle/Emulsion Templating (co-MET) using template surfactant CTAB (cationic), SDS (anionic), and Triton X-100 (nonionic). Silica synthesized were characterized using FTIR instruments, XRD, SEM-EDS, TEM, and BET. EDS characterization results show the synthesized material is pure silica which only consists of silicon (Si) and oxygen (O). Silica produced with template CTAB (1.0 mM)/acrylamide having an average pore diameter of 1,205 nm and surface area of 545,909 (m²/g); whereas with template SDS (8,2 mM)/acrylamide having an average pore diameter of 1,199 nm and surface area of 423,280 (m²/g); and silica with template TX-100 (0,24 mM)/acrylamide having an average pore diameter of 1,202 nm and surface area of 398,263 (m²/g). Porous silica successfully used as AlCl₃ catalyst support by impregnation technique. Application of AlCl₃/SiO₂ catalyst in the reaction of benzaldehyde with ethanol produces benzaldehyd diethyl acetal, which was analyzed using GC-MS with a composition of 45,14%.]