

Sintesis silika berpori melalui teknik co-MET sebagai support katalis FeCl₃ dan HSO₃CF₃ untuk reaksi benzaldehid dan etanol = Synthesis of porous silica through co-MET technique as a catalyst support of FeCl₃ and HSO₃CF₃ for benzaldehid and ethanol reaction

Arvinda Widyana, author

Deskripsi Lengkap: <https://lib.ui.ac.id/detail?id=20345831&lokasi=lokal>

Abstrak

Katalis heterogen dengan support silika berpori yang disintesis dengan teknik co-Micelle/Emulsion Templating (co-MET) memiliki porositas yang seragam. Penggunaan polimer kationik, 2-(Acryloyloxy)-N,N,N-Trimethylethanaminium Chloride dalam teknik co-MET berfungsi untuk menstabilkan emulsi dan membentuk struktur mesopori.

Dalam penelitian ini FeCl₃ dan HSO₃CF₃ diimpregnasikan pada silika makro/mesopori yang dihasilkan kemudian dikarakterisasi menggunakan SEM, EDS, FTIR, dan XRD. Data SEM menunjukkan bahwa pori yang dihasilkan pada silika semakin meningkat seiring bertambahnya konsentrasi polimer kationik. Pada FTIR, impregnasi FeCl₃ dan HSO₃CF₃ berhasil dengan adanya peak pada 1036 cm⁻¹ (ikatan Si-O-Fe), 462 cm⁻¹ (vibrasi Fe-Cl) dan 615 cm⁻¹ (ikatan C-S).

Uji katalitik reaksi antara benzaldehid dan etanol menunjukkan bahwa katalis HSO₃CF₃-silika makro/mesopori dengan konsentrasi 5% polimer kationik memiliki hasil yang lebih baik dibandingkan katalis dengan konsentrasi polimer kationik 0,5%, 1%, 2,5% dan 10%.

Heterogeneous catalysts with porous silica support which were synthesized by co-Micelle/Emulsion Templating (co-MET) techniques have uniform porosity. The use of cationic polymers, 2-(Acryloyloxy)-N,N,N-trimethylethanaminium chloride in co-MET technique serves to stabilize the emulsion and form mesoporous structure.

In this study, FeCl₃ and HSO₃CF₃ were impregnated into macro/mesoporous silica and then were characterized using SEM, EDS, FTIR, and XRD. SEM data show that the silica pores generated in increases with increasing concentrations of cationic polymer. On FTIR spectrum, impregnation of FeCl₃ and HSO₃CF₃ proven by the peak at 1036 cm⁻¹ (Si-O-Fe bond), 462 cm⁻¹ (vibrations of Fe-Cl) and 615 cm⁻¹ (C-S bond).

Catalytic reaction between benzaldehid and ethanol shows that HSO₃CF₃-Silica macro/mesoporous catalyst with a 5% concentration of cationic polymer has the best result than those with cationic polymer concentration of 0,5%, 1%, 2,5% and 10%.