Studi spektroskopi struktur dan sifat zeolit ZSM 5 mesopori terimpregnasi oksida kobalt = Spectroscopy study of structure and properties of mesoporous ZSM 5 zeolite impregnated with cobalt oxides

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Abstrak

[Pada penelitian ini telah dilakukan studi spektroskopi dari zeolit ZSM-5 mesopori terimpregnasi oksida kobalt secara komprehensif. Co/ZSM-5 mesopori telah menarik perhatian para peneliti untuk digunakan sebagai katalis heterogen dalam reaksi oksidasi parsial metana. Dalam penelitian ini dilakukan sintesis zeolit NaZSM-5 mesopori dengan metode double template dengan TPAOH sebagai agen pengarah struktur dan PDDA sebagai template mesopori. Sebagian zeolit NaZSM-5 dimodifikasi menjadi HZSM-5 melalui proses tukar kation dengan NH4+ yang dilanjutkan dengan kalsinasi pada suhu 550°C. Selanjutnya, zeolit NaZSM-5 dan HZSM-5 diimpregnasi dengan ion kobalt dan dikalsinasi pada 550°C membentuk Co/NaZSM-5 dan Co/HZSM-5. Lalu, zeolit mesopori NaZSM-5, HZSM-5, Co/NaZSM-5, dan Co/HZSM-5 dikarakterisasi secara ekstensif dengan XRD, SEM, AAS, FTIR, 27Al Solid State NMR, Microbalance, dan Surface Area and Pore Size Analyzer untuk menjelaskan pengaruh perbedaan sifat permukaan zeolit katalis terhadap fenomena perbedaan hasil reaksi katalisis oksidasi parsial metana dengan oksidator oksigen dan katalis zeolit mesopori Co/NaZSM-5 dan Co/HZSM-5 pada penelitian sebelumnya, di mana persen konversi metana menjadi metanol meningkat seiring dengan waktu pada Co/HZSM-5 namun sebaliknya pada Co/NaZSM-5 justru menurun seiring dengan waktu. Hasil analisis menunjukkan bawa keasaman zeolit ZSM-5 sebagai support katalis berpengaruh terhadap loading Co dan aktivitas katalis.
.....Spectroscopy study of mesoporous ZSM-5 zeolite impregnated with cobalt oxides has been done comprehensively. Mesoporous Co/ZSM-5 has gained the researchers' attention for being used as heterogeneous catalyst for partial oxidation of methane. In this research, mesoporous NaZSM-5 zeolite was synthesized by using double template method with TPAOH as structure directing agent (SDA) and PDDA as mesoporous template. Some of NaZSM-5 were modified to HZSM-5 through NH4+-exchange process followed by calcination at 550°C. NaZSM-5 and HZSM-5 zeolite were impregnated with cobalt ions and calcined at 550°C to form Co/NaZSM-5 and Co/HZSM-5. Then, mesoporous NaZSM-5, HZSM-5, Co/NaZSM-5, and Co/HZSM-5 zeolite were extensively characterized using XRD, SEM, AAS, FTIR, 27Al Solid Sate NMR, Microbalance and Surface Area and Pore Size Analyzer to explain zeolite surface characteristics influence on difference results from methane partial oxidation with O2 as oxidant using mesoporous Co/NaZSM-5 and Co/HZSM-5 zeolite as catalyst in recent research. In which by using Co/HZSM-5 as catalyst %conversion of methane to methanol increase by the time, but %conversion decrease by using Co/NaZSM-5. By analysis, it can be concluded that ZSM-5 zeolite's acidity affect the loading of Co and catalyst activity.;Spectroscopy study of mesoporous ZSM-5 zeolite impregnated with cobalt oxides has been done comprehensively. Mesoporous Co/ZSM-5 has gained the researchers' attention for being used as heterogeneous catalyst for partial oxidation of methane. In this research, mesoporous NaZSM-5 zeolite was synthesized by using double template method with TPAOH as structure directing agent (SDA) and PDDA as mesoporous template. Some of NaZSM-5 were modified to HZSM-5 through NH4+-exchange process followed by calcination at 550°C. NaZSM-5 and HZSM-5 zeolite were

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