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METAL MODIFIED HETEROGENEOUS CATALYSTS FOR SYNTHESIS OF PHARMACEUTICAL COMPONENTS: REACTION MECHANISM AND CATALYST EVALUATION

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Efficient, pristine, high yield and cost effective synthesis of pharmaceutical components, drugs, vitamins and fragrances using metal modified heterogeneous catalysts are important from the academic and industrial point of view. The research results in this lecture will cover the opening of monoterpene epoxide to a potent anti-Parkinson compound over Fe- and Ce- modified beta zeolite and Si-MCM-41 mesoporous material. A novel reaction pathway for synthesis of (1R, 2R, 6S)-3-methyl-6-(prop-1-en-2-yl) cyclohex 3-ene-1, 2-diol with high selectivity using isomerization of verbenol oxide over metal modified heterogeneous catalyst will be presented. Furthermore, effect of acidity and texture of H-beta-25, H-beta-300 microporous-, H-MCM-48 mesoporous and hybrid microporous materials on the synthesis of paramenthane diol exhibiting anti-Parkinson activity will be elaborated. The highest selectivity to desired product of diol was obtained over mild acidic H-Beta-300 catalyst. Influence of methods of metal modification and types of supports in the two step synthesis of monoterpenoid dioxinols exhibiting analgesic activity from isopulegol and benzaldehyde will be discussed. The main focus of presentation will be reaction mechanism, catalyst synthesis, characterization and evaluation of catalytic properties in liquid phase reactions. The in-depth physico-chemical characterization results of catalyst will be correlated with the catalytic activity and selectivity to the desired products. It is noteworthy to report that metal modified heterogeneous catalysts were possible to be regenerated and reuse for the reactions studied.

Biography

Narendra Kumar obtained his Doctor of Technology in Chemical Engineering from Abo Akademi University, Turku, Finland. He has been working at the Laboratory of Industrial Chemistry and Reaction Engineering, Abo Akademi University since 1990 to till present. His duties are research, education, teaching, supervision of PhD, MSc and BSc students. His research focuses on Heterogeneous catalysis, catalyst synthesis and characterization, petro-chemical reactions, fine chemicals, pharmaceuticals and speciality chemicals synthesis, environmental catalysis, catalytic reaction mechanism. He has given several plenary, keynote and invited lectures at international Conferences. He has over 250 peer reviewed articles in international journals in the field of heterogeneous catalysis, chemical engineering, fine chemicals, pharmaceuticals & speciality chemical synthesis and environmental catalysis. He has received several awards and his h-index is 31. He is a Member of the editorial board of the *Journal Waste and Biomass Valorization*.

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