

A STUDY ON DEALUMINATED ZEOLITE BEA CATALYZED GREEN SYNTHESIS OF BIOLOGICAL ACTIVE IMIDAZOLE SCAFFOLDS THROUGH MCRS

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An attempt has been made to assess the catalytic activity of a variety of large and medium pore zeolites. An environmental benign synthesis of imidazole, biologically active scaffold, through multi-component reactions (MCRs) was investigated in the presence of H-BEA, H-MOR, H-ZSM-5 and H-Y zeolite catalysts. Amongst these, zeolite H-BEA with Si/Al ratio (SAR) 12 was found efficient catalyst for the synthesis of various imidazole scaffolds from multicomponent reaction between benzil, NH_4OAc , substituted aromatic aldehydes and amines. Controlled dealumination of zeolite H-BEA (12) was found efficient method to improve catalytic activity, thereby yield of imidazole scaffolds. These synthesized catalysts have been characterized to have an idea about elemental, spectral, thermal and catalytic characteristic of these catalysts using various techniques. Amongst the dealuminated H-BEA catalysts, zeolite H-BEA with SAR 15 exhibited higher catalytic activity towards the green and environmentally benign synthesis of highly substituted imidazoles i.e. 1-benzyl-2, 4, 5-triphenyl-1 H-imidazoles and 1, 2, 4, 5-tetraimidazoles under thermal solvent-free conditions, in excellent yields and within shorter reaction time. Moreover, the effect of polarity, surface acidity and extra framework Al species of the catalysts has been well demonstrated using pyridine FT-IR, ^{27}Al NMR and ^1H MAS NMR techniques. The catalyst was found reusable upto six catalytic runs without losing its significant activity. The investigated green protocol will be useful to execute other organic transformations of industrial interest.

Biography

Jenifer J Gabla has obtained her Master's degree in Organic Chemistry, in the year 2013 from Uka Tarsadia University, Bardoli, Gujarat. She is currently pursuing her PhD in the area of solid acid catalyzed multi-component reactions for the synthesis of biologically active drug-like molecules, under the guidance of Dr Kalpana C Maheria, at Applied Chemistry Department, Sardar Vallabhbhai National Institute of Technology (SVNIT), Surat, Gujarat, India. She has presented her research in several national and international conferences/ symposiums. She has published 2 papers in reputed journals.

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