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# Development of new hexamine and DABCO-based ionic liquids as Green solvents for organic reactions

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Hexamethylenetetramine-based and DABCO-based ionic liquids were synthesized. These readily available DABCO-based and Hexamethylenetetramine-based ionic liquids behave as recyclable catalysts for various organic reactions, such as, the Michael reaction, the Knoevenagel condensation, Henry reactions, aldol reactions, etc. It will be demonstrated that the DABCO-based ionic liquids behave as recyclable catalysts for the Michael addition reaction of a broad range of active methylene compounds, and α, β-unsaturated carboxylic esters and nitriles, offering excellent yields in short duration. The Knoevenagel condensation of various aromatic/aliphatic/heterocyclic aldehydes and ketones with active methylene compounds using DABCO-based and Hexamethylenetetramine-based ionic liquids afforded the condensation products in excellent yields in short durations. The use of DABCO-based ionic liquid, 1-butyl-4-aza-1-azadiabicyclo [2.2.2] octane hydroxide, as an efficient catalyst for Henry reaction of various carbonyl compounds with nitroalkanes affording very high yields within short duration will also be highlighted. These ILs can also be used as green catalysts for aldol reactions of various aromatic aldehydes and ketones under solvent free conditions at room temperature; and very high to excellent yield can be obtained. They also can be used as catalysts for synthesizing fused pyrimidine derivatives, such as, 7-thioxo-pyrazolopyrano-pyrimidinones, 2-thioxo-benzochromeno-pyrimidinones, etc. These methods are very simple, clean and avoid hazardous organic solvents. The catalysts could be easily recovered and recycled for several times. Thus, development of a series of ionic liquids which could be easily prepared and used as recyclable catalysts for various organic reactions will be highlighted. The process developed is an improved process which offers several advantages over other processes and would contribute to environmentally friendly and safer processes

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