General introduction

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1. A brief introduction of C-N bond

The construction of the C-N bonds of aromatic compounds are particularly important in the field of medicinal chemistry. C-N bond formation reaction is thermodynamically more favourable than C-C bond formation. The construction of C-N bond is of significant importance because it introduces nitrogen atom in organic molecules. Nitrogen containing compounds are extremely important because of their abundance in various natural products and in the synthetic organic compounds that show interesting biological activities. Nitrogen containing organic compounds has gained a considerable amount of attention in synthetic organic chemistry because of its several application in pharmaceutical and agrochemical industries. Beside this, it also plays a role in constructing of naturally occurring biological active compounds like amino acids, naturally occurring heterocyclic compounds, drugs etc. Extensive work has been done on the formation of C-N bond formation and exploring the importance and scope of nitrogen containing compounds. The importance of C-N bond and broad spectrum application of nitrogen containing compounds compels author to carry out the methodological work on carbon-nitrogen bond formation and thereby synthesizing some nitrogen containing compounds.

2. Objectives of the thesis

The C-N bond forming reactions are of great importance because of the enormous application in the field of chemical as well as in biology. There are lot of methodologies in literature which deals with the synthesis of C-N bond forming reaction. Most of the methodologies are not easy, straight-forward and are not environmentally benign. Therefore the development of mild and green methodology is

still required. There are several type of compounds having C-N bond, out of which, a few methodological works are reported in these thesis.The thesis contains the synthesis of pyrazine derivatives from the reaction of ethylenediamine with 1,2-diketone or α-hydroxy ketone or α-bromo ketone under neat reaction condition, synthesis of pyrazines from ethylenediamine and 1, 2-diketone or its analogues catalyzed by silica-gel, synthesis of nitriles from aldehydes and hydroxylamine hydrochloride on silica-gel, synthesis of 5-substituted-1H-tetrazole from aldehydes catalyzed by $TiCl_3$. The unique biological features of these synthesized compounds having C-N bond inspired author to carry out the methodological work in this thesis.

The principal objective of this thesis is to introduce new methodological work for the synthesis of these important compounds by C-N bond forming reactions. The new methodologies presented in this thesis are cost-effective, mild and environmentally benign which meet the requirement under the aspect of green chemistry.