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SYNTHESIS AND SPECTRAL CHARACTERISATION OF NEW β-AMINOKETONE COMPOUNDS

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ABSTRACT : This works reported the preparation of three new Mannich-base compounds namely: 2-(3-nitrophenyl)amino) (phenyl)methyl)cyclohexan-1-one (A), 2-((4-methoxyphenyl)(phenylamino)methyl)- cyclohexan-1-one (B) and 2-((4-(dimethylamino) phenyl) ((3-nitrophenyl)amino) methyl) cyclohexan-1one (C). The formation of these compounds were based on Mannich approach in which the reaction of an aldehyde (benzaldehyde for A; 4-methoxybenzaldehyde for B and 4,4'-dimethylaminobenzaldehyde for C), cyclohexanone and an aromatic amine (m-nitroaniline for A and C and aniline for B) were implemented to obtain the title compounds. Calcium chloride was used as catalyst and ethanol as reaction medium. A range of physico-chemical tools were used to charcteris the isolated compounds. These include; FT-IR, ^{1}H-, ^{13}C-NMR, mass spectra, elemental analysis and melting points. The title compounds can be used as precursors in the design and fabrication of potential materials including Schiff-bases.

Key words : Mannich-approach, spectral studies, β-aminoketone compounds, a one-pot reaction.

INTRODUCTION

Mannich-type reaction is an important approach in the organic synthesis, which leads to the formation of C-C bond. This reaction has been used to prepare a range of compounds that has an important role in the development of organic and inorganic chemistry (Fleming and Trost, 1991; Arend *et al*, 1998; Blicke, 1942). Mannich-reaction is a transformation reaction in which a three-component (a ketone whether aromatic or aliphatic, an aldehyde and an amine) react to form â-aminoketones. These â-aminoketones represent important intermediates for the synthesis of various pharmaceutical and natural products (Davis, 2006; Evans *et al*, 2003; Abonia *et al*, 2004). The important of the Mannich-reaction has been powered by the role of nitrogen atom in drugs and natural products. Further, the three-components reaction may result in the formation of potential compounds including chelating agents (Kulkarni *et al*, 2012).

The method that rely on the two-component system using preformed electrophiles, like imines and stable nucleophiles, such as enolates, enol ethers and enamines (Trost and Terrell, 2003). In other hand, the way that used a wide range of structural deviations is a one-pot three-component method (Matsunaga *et al*, 2003; Juhl *et al*, 2001).

Recently, mannich-base reaction has played a role in the development of environmentally friend reactions and atom-economic catalytic processes in which Mannich-base reaction is relied on unchanged ketones, amines, and aldehydes (Cordova *et al*, 2002; Kobayashi *et al*, 2002; Hayashi *et al*, 2003; Wenzel and Jacobsen, 2002; Azizi *et al*, 2006). Mannich-base compounds with carbonyl oxygen and nitrogen donor atoms are interesting organic species that have an important role in coordination chemistry. These compounds act as ligands that have the ability to form complexes with transition and representative elements. Accordingly, these compounds have considered as potential scavengers in the removal of heavy elements from water and waste treatment (Chaisuwan *et al*, 2010). Further, compounds derived from Mannich-reaction and their complexes have applications in different fields including; medicine, pharmaceutical activities, other biological activity, anticancer, antibacterial, and antiviral properties (Bala *et al*, 2014).

In this paper, we report the synthesis and spectral characterization of three new Mannich-base compounds. The title compounds were prepared using a one-pot method. The title compounds considered to be important intermediates that may use in the organic synthesis and coordination chemistry.