Asian Journal of Chemistry Vol. 21, No. 4 (2009), 3253-3256

Simple, Efficient and Solvent-Free Method for Quantitative Regeneration of Carbonyl Compounds from Oximes by Gaseous Bromine

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Ketoximes and aldoximes are efficiently deprotected to their corresponding carbonyl compounds using bromine in the gas form under solvent-free conditions. This method is high yielding, fast, clean and more suitable for practical organic synthesis.

Key Words: Oximes, Gaseous bromine, Solvent-free conditions.

INTRODUCTION

Oximes of aldehydes and ketones are generally solid and crystalline compounds. They constitute an efficient method for the isolation, purification and characterization of carbonyl compounds[1]. In addition they can be prepared from non-carbonyls[2a-c] and therefore, their transformation to the corresponding carbonyl compounds is an important reaction to prepare aldehydes and ketones. So far, a good number of methods based on hydrolytic[3], reductive[4] and oxidative[5] reactions have been developed for deoximation. The oxidative reactions methods make use different kinds of oxidizing agents. These include pyridinium chlorochromate[5], methyl triphenylphosphonium peroxydisulfate[6], aqueous hydrogen peroxide activated by ammonium heptamolybdate catalyst[7], chromic anhydride, chlorotrimethylsilane[8], ionene supported peroxodisulfates[9], ammonium persulphate-silica gel[10] and others such as mixed-addenda vanadomolybdophosphate, $H_6PMo_9V_3O_{40}$[11], dinitrogen tetraoxide[12], silphos[PCl_3-n(SiO_2)n][13], $MoO_2(acac)_2$[14], periodic acid[15] and photosensitized oxidative by platinum(II) terpyridyl acetylide complex[16].

Herein, the authors reported gaseous bromine, as a fast, efficient and clean reagent for the deprotection of oximes under solvent-free conditions. The method is superior as the reactions occur at room temperature with rapid rate, with no formation of over oxidation products, with high yields and is easy work up.

EXPERIMENTAL

All chemicals were purchased from Merck, Aldrich or Fluka and used as received. Melting points were measured by using the capillary tube method with an electro thermal 9200 apparatus and are uncorrected. Analytical TLC was carried out using Merck 0.2 mm silica gel 60 F-254 Al-plates. Infrared (IR) spectra were recorded on a Perkin-Elmer 1720-X FT-IR spectrometer using KBr pellets.