

WATER MEDIATED CONDENSATION REACTION OF ALDEHYDES AND AMINES**NEERJA GUPTA¹, RUBY NAAZ^{1*} AND G.D. NIGAM²**

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ABSTRACT

The condensation reactions of aliphatic and aromatic aldehydes and amines carried out efficiently in a water suspension medium. The formation of imines and imidazoles are carried out without catalyst using water as solvent. In this method yields are high, reactions are fast and products are isolated easily by filtration.

KEYWORDS

Water suspension medium, high yields, fast reactions, filtration.

INTRODUCTION

Schiff bases or N-Substituted imines are prepared by aliphatic and aromatic aldehydes condensed with aliphatic and aromatic primary amines, which are used as polymer, analytical, medicinal and liquid crystalline materials¹. Recently, environmentally benign synthesis have received considerable attention and solvent free protocols have been developed.² The condensation reaction of benzaldehydes (1) and anilines (2) to benzylidene-anilines (3) occurred efficiency in a water suspension medium³, without using any acid catalyst and the products were isolated simply by filtration⁴. Aldehydes (1) also show condensation reaction with N, N'-disubstituted ethylenediamines (4) and give tetrahydroimidazoles (5) in a water suspension medium in high yields.

MATERIALS AND METHOD***Green procedure for the preparation by benzylidene anilines:***

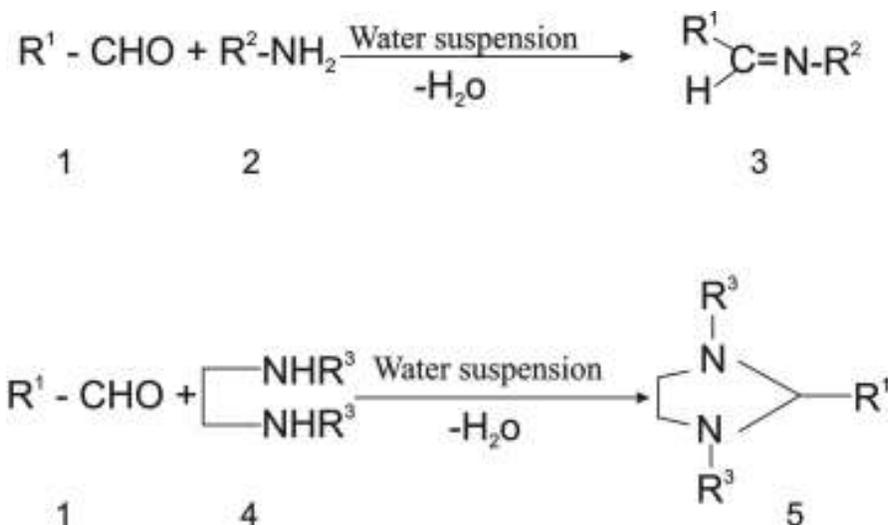
A mixture of liquid benzaldehyde (0.25g, 2.35 mmol) and powdered crystalline p-chloroaniline (0.30g, 2.35 mmol) was stirred in a small amount of water (5 ml) at room temperature for 30 min. The crystalline powder formed was collected by filtration-washed with water and dried in desiccators to give p-chlorobenzylideneaniline (0.50 g, 99% yield). The crude crystals thus obtained were recrystallized from ethanol to give pure compound as yellow prisms (m.p. 58-61°C).

Green procedure for the preparation by tetrahydroimidazoles:

A mixture of liquid benzaldehyde (0.50g, 4.71 mmol) and crystalline powder of N, N'-diphenylethylenediamine (1.00g, 4.71 mmol) was stirred in a small amount of water (3 ml) at room temperature for 30 min. The

crystalline powder formed was collected by filtration, washed with water and dried in a desiccators to give 1, 2, 3-triphenyl tetrahydroimidazole (1.30 g, 92% yield). The

crude crystals thus obtained were recrystallised from toluene to give pure as colorless needles (m.p. 80-83°C).



RESULTS AND DISCUSSION

The conventional method with organic solvent is less convenient. A 1:1 mixture of benzaldehydes and anilines is refluxed in benzene containing a small amount of benzenesulfonic acid as catalyst for several hours under azeotropic conditions using Dean-Stark apparatus. Solvent is removed under reduced pressure the residue is recrystallized from solvent to give the corresponding benzylideneaniline in 45-95% yields.

This new water mediated and environmentally benign method is more

useful because neither acid catalyst nor aromatic solvent separations are needed⁵, and the product can be isolated simply by filtration. The condensations reactions occur very efficiently even in the presence of water at room temperature.

CONCLUSION

Simple and green procedures⁶ for the synthesis of various kinds of imines and tetrahydroimidazoles have been used that requires neither acid catalyst nor a large excess of aromatic solvents such as benzene⁷.

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