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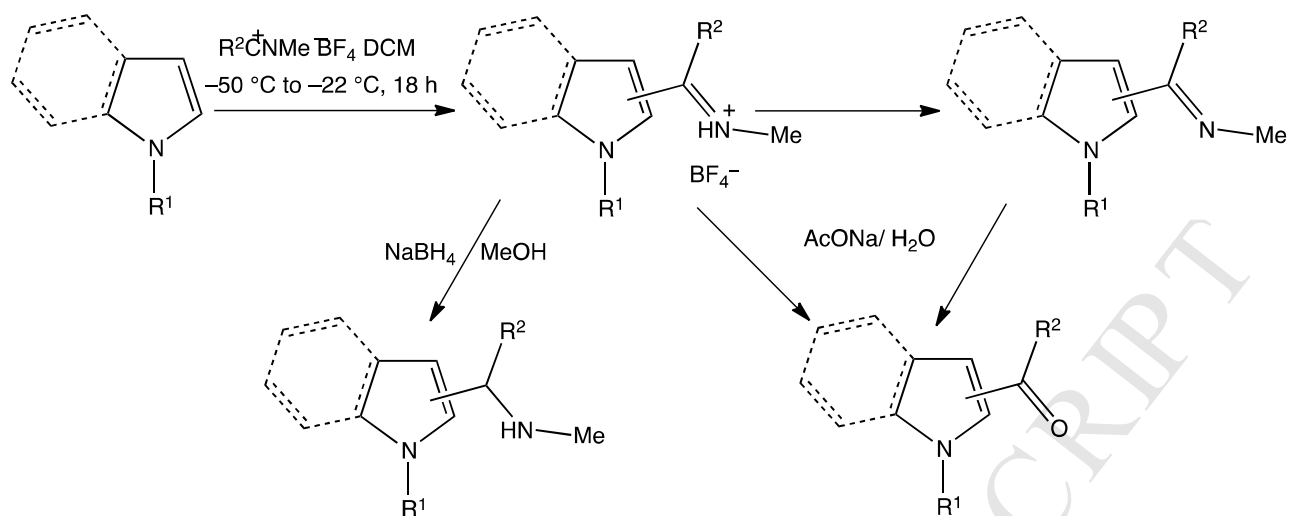
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Graphical Abstract



Reactions of nitrilium salts with indole and pyrrole and their derivatives in the synthesis of imines, ketones and secondary amines[†]

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[†]Dedicated to the memory of Robert Giles, 1961 - 2005 and Alan Katritzky, 1928 - 2014

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Abstract

Reactions of *N*-methyl- and *N*-ethyl-nitrilium salts with indole and pyrrole and their derivatives yield imines or imine salts in good yields. The related imines are obtained from the salts after careful basification and hydrolysis of the imine salts or the imines by heating with aqueous base give the related ketones in good yields. Alternatively, the imine salts can be reduced using sodium borohydride in methanol to give the related secondary amines.

Key words: indole(s), pyrrole(s), ketones, secondary amines

Introduction

The acylation of indole and pyrrole and their derivatives have been studied over a long period of time, particularly because many have been found to be important in routes to pharmacologically active substances. However, a major problem, particularly associated with early work, using for example acyl halides, concerned the ease of the acid catalysed polymerisation reactions of indoles and pyrroles which resulted from the formation of protic acids as co-products.¹ The well established positional selectivity in electrophilic substitution reactions of indole and pyrrole that normally results from attack at the 3- and 2-positions respectively has been reviewed.² The recent report of

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