SUCCINIMIDE-N-SULFONIC ACID: A MILD, EFFICIENT, AND REUSABLE CATALYST FOR THE CHEMOSELECTIVE TRIMETHYLSILYLATION OF ALCOHOLS AND PHENOLS

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GRAPHICAL ABSTRACT

\[ \text{ROH} \xrightarrow{\text{HMDS / SuSA}} \text{ROSiMe}_3 \]

Abstract Succinimide-N-sulfonic acid (SuSA) is easily prepared by the reaction of succinimide with chlorosulfonic acid. This reagent is able to efficiently catalyze the chemoselective trimethylsilylation of alcohols and phenols with hexamethyldisilazane (HMDS). All reactions were performed under mild reaction conditions, giving excellent yields.

Keywords Succinimide-N-sulfonic acid; alcohols; phenols; trimethylsilylation; hexamethyldisilazane

INTRODUCTION

Trimethylsilylation of organic compounds having labile hydrogen atoms find increasing use in analytical and preparative organic chemistry.¹ This conversion enhances the solubility of compounds in nonpolar solvents, increases the thermal stability, and has been extensively used to increase the volatility of compounds for gas chromatography and mass spectrometry as well. Moreover, protection of the hydroxyl groups as their corresponding trimethylsilyl ethers is of vital importance in the total synthesis of complex organic molecules.

Generally, the formation of silyl ethers is carried out by treatment of alcohols with silyl chlorides or silyl triflates under the influence of basic conditions. However, some of these methods suffer from drawbacks such as lack of reactivity or the difficulty in removing amine salts derived from the reaction of by-produced acids and co-bases during the course of the reaction. Hexamethyldisilazane (HMDS) is a cheap, stable, and commercially available reagent. O-silylation of alcohols using HMDS is an attractive alternative, since the only by-product of the reaction is ammonia, which is easily removed from the reaction mixture. However, its main drawback is its poor silylating power, which needs forceful conditions...