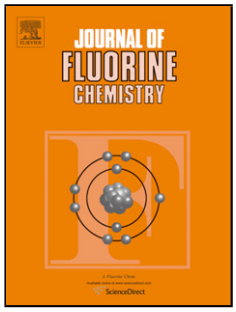

Title: Solvent-Free Synthesis of Alkyl and Fluoroalkyl Sulfonium Salts from Sulfides and Fluoroalkyl Trifluoromethanesulfonates

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<AT>Solvent-Free Synthesis of Alkyl and Fluoroalkyl Sulfonium Salts from Sulfides and Fluoroalkyl Trifluoromethanesulfonates

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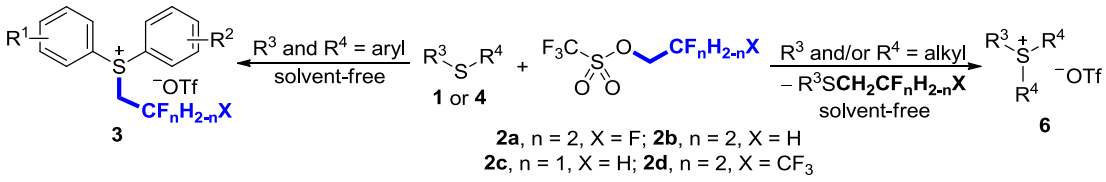
<ABS-HEAD>Abstract►



<ABS-HEAD>Highlights► Solvent-free facile synthesis of alkyl and fluoroalkyl sulfonium salts. ► Fluoroalkyl trifluoromethanesulfonates were used as fluoroalkyl sources. ► The reaction could selectively afford alkyl- or fluoroalkylsulfonium salts. ► The reactants and reaction temperature dramatically affected the reaction.

<ABS-HEAD>Abstract

<ABS-P>A series of diaryl(fluoroalkyl)sulfonium salts were synthesized from electron-rich diaryl sulfides and fluoroalkyl trifluoromethanesulfonates under solvent-free conditions. Unlike diaryl sulfides, dialkyl and alkyl(aryl) sulfides reacted with fluoroalkyl trifluoromethanesulfonates (e.g. $CF_3SO_3CH_2CF_3$, $CF_3SO_3CH_2CF_2H$) to provide trialkyl- and aryl(dialkyl)sulfonium trifluoromethanesulfonates in good yields, wherein dialkyl- and alkyl(aryl)(fluoroalkyl)sulfonium salts were formed, respectively, and nucleophilically attacked by a second sulfide to yield the non-fluorinated sulfoniums. The S_N2-type reaction could stop at the first step and exclusively afford dialkyl- and alkyl(aryl)(fluoroalkyl)sulfonium salts, which was dramatically dependent upon the structure of sulfides, the nature of fluoroalkyl trifluoromethanesulfonates, the reactant ratio, and/or the reaction temperature. This protocol allows for an efficient and convenient access to a variety of alkyl and fluoroalkyl sulfonium salts.

<KWD>Keywords: sulfides; fluoroalkyl trifluoromethanesulfonates; sulfonium salts.

<H1>1. Introduction

Sulfonium salts are versatile reagents in the fields of chemistry and materials science [1,2]. Triarylsulfonium salts have been widely used as photoinitiators in cationic polymerizations and as photoacid generators in the areas of coatings, adhesives, photoresists, microfabrication, and patterning [2,3]. Vinylsulfoniums can *in situ* form