Supporting information

Preparation of Trifluoromethyl- and Difluoromethylsilanes via an Unusual Magnesium Metal Mediated Reductive Tri- and Difluoromethylation of Chlorosilanes Using Tri- and Difluoromethyl Sulfides, Sulfoxides and Sulfones

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General: Unless otherwise mentioned, all the other reagents were purchased from commercial sources. Trifluoromethyl phenyl sulfone and sulfoxide were prepared from trifluoromethyl phenyl sulfide, which was commercially obtained or prepared from fluoroform and PhSSPh.¹⁵ Other known sulfides, sulfoxides and sulfones were prepared according to the reported procedures.^{16, 20-25} Mg turnings were used without any special pretreatment. DMF was distilled over calcium hydride and stored over activated molecular sieves. All the reactions were carried out using Schlenk equipment, and the reactions were monitored by ¹⁹F NMR periodically. ¹H, ¹³C, ¹⁹F and ²⁹Si NMR spectra were recorded on 500 and 360 MHz superconducting NMR spectrometers. ¹H NMR chemical shifts were determined relative to internal (CH₃)₄Si (TMS) at δ 0.0 or to the signal of a residual protonated solvent: CDCl₃ δ 7.26. ¹³C NMR chemical shifts were determined relative to internal TMS at δ 0.0 or to the ¹³C signal of solvent: CDCl₃ δ 77.0. ¹⁹F NMR chemical shifts were determined relative to internal CFCl₃ at δ 0.0. ²⁹Si NMR chemical shifts were determined relative to internal TMS at δ 0.0. IR spectra were obtained on a FTIR Spectrometer. GC-MS data were recorded on GC-MS spectrometer with a mass selective detector at 70 eV. High-resolution mass data of low boiling compounds were recorded on a GC chromatograph with micromass GCT (time of flight) mass spectrometer. Other high-resolution mass data were recorded on a high-resolution mass spectrometer in the CI mode.

^1H NMR
 $(\text{CH}_3\text{CH}_2)_3\text{Si}-\text{CF}_2\text{H}$
3i

^{13}C NMR
 $(\text{CH}_3\text{CH}_2)_3\text{Si}-\text{CF}_2\text{H}$
3i

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UPLC MASS SPECT

07/26/2002 14:40 J1020621B1

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