Trimethyl(trifluorovinyl)silane

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Received: 6 June 2000 / Accepted: 6 July 2000 / Published: 30 July 2000

Trimethyl(trifluorovinyl)silane was prepared [1] without characterization details from bromotrifluoroethylene, which is not commercially available. The product was synthesized using several other reagents: chlorotrifluoroethylene, trifluoroethylene and various alkyl lithium compounds. An example of preparation is given here. Chlorotrifluoroethylene 3.8g (32.6 mmol) was vacuum transferred in a large storage tube over 50 ml distilled ether. t-BuLi/pentane 20 ml (32.6 mmol) was added dropwise under an argon atmosphere to the contents of the storage tube kept at -78°C. After 70 minutes addition of t-BuLi was completed and trimethylsilylchloride 3.54g (32.6 mmol) was added dropwise over a period of 1 h. The material was allowed to warm up slowly to room temperature for 7 h. Fractional distillation gave trimethyl(trifluorovinyl)silane as a colorless liquid (1.1g, 22% yield).

B.p. 65-66°C.

$^1$H NMR (200 MHz, neat): 0.23 (s, 3H).

$^{13}$C NMR (200 MHz, neat): -3.7 (s), 131.3 (ddd, $J = 254.5$, 67.1 and 2.8 Hz), 161.3 (ddd, $J = 312.2$, 271.6 and 33.6 Hz).

$^{19}$F NMR (200 MHz, neat, vs. CFCl$_3$): -88.8 (dd, $J = 70.9$ and 25.4 Hz), -117.6 (dd, $J = 116.5$ and 70.8 Hz), -198.6 (dd, $J = 116.4$ and 25.2 Hz).

MS (EI, %): 154 (M$^+$, 12), 139 ([M-CH$_3$]$^+$, 21), 81 (C$_2$F$_3^+$, 100), 77 ([Si(CH$_3$)$_2$F]$^+$, 50), 74 ([HSi(CH$_3$)$_3$]$^+$, 45), 73 ([Si(CH$_3$)$_3$]$^+$, 19), 59 (CSI$^+$, 41).

Reference


Sample availability: sample is not available.

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