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Si-TRIFLUOROSILYL SUBSTITUTED VINYL(ETHYNYL)SILANES

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A series of organyl(β-trifluorosilylvinyl)silanes different in degree of addition were obtained by hydrosilylation of dimethyldiethynyl-, methyltriethynyl- and tetraethynylsilanes with trichlorosilane in the presence of H_2PtCl_6 followed by treatment of the adducts formed with 40% hydrofluoric acid. The degree of addition is dependent on the molar ration of reagents. Thus, the reaction of tetraethynylsilane with two moles of trichlorosilane followed by treatment with HF affords triethynyl(β-trifluorosilylvinyl)silane and diethynyl-bis(β-trifluorosilylvinyl)silane.

$$(HC{\equiv}C)_4Si + 2HSiCl_3 \xrightarrow{HF} (HC{\equiv}C)_3SiCH{=}CHSiF_3 + (HC{\equiv}C)_2Si(CH{=}CHSiF_3)_2$$

In a ratio of 1:4, ethynyltris(β-trifluorosilylvinyl)-silane and tetrakis(β-trifluorosilylvinyl)silane were prepared.

$$(HC{\equiv}C)_4Si + 4HSiCl_3 \xrightarrow{HF} HC{\equiv}CSi(CH{=}CHSiF_3)_3 + Si(CH{=}CHSiF_3)_4$$

The following adducts were obtained in a similar way:

$$Me_2Si(C{\equiv}CH)_2 + HSiCl_3 \xrightarrow{HF} HC{\equiv}CMe_2SiCH{=}CHSiF_3 + Me_2Si(CH{=}CHSiF_3)_2$$

$$MeSi(C{\equiv}CH)_3 + 2HSiCl_3 \xrightarrow{HF} Me(HC{\equiv}C)_2SiCH{=}CHSiF_3 + Me(HC{\equiv}C)Si(CH{=}CHSiF_3)_2 + MeSi(CH{=}CHSiF_3)_3$$

The compounds formed are readily involved in the reaction organometallic compounds at the Si-F bond. For example,

$$Me_2Si(CH{=}CHSiF_3)_2 + 6\ BrMgC{\equiv}CSiMe_3 \longrightarrow Me_2Si\left[CH{=}CHSi(C{=}CSiMe_3)_3\right]_2$$