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RADICAL ADDITION OF FLUOROALKYL IODIDES TO VINYLTRIMETHYLSILANE IN THE PRESENCE OF COPPER AND STEREOSPECIFIC SYNTHESIS OF CORRESPONDING OLEFINS

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Fluoroalkyl iodide $R_F(R_F=(CF_2)_nCl$, n=6(1a); 4(1b); 2(1c); $CF_3(CF_2)_5$ (1d); $H(CF_2)_4$ (1e); $(CF_2)_4O(CF_2)_2SO_2F$(1f) reacted readily with vinyltrimethylsilane($CH_2=CHSiMe_3$(2)) in the presence of catalytic amounts of copper in acetonitrile to give adduct ($R_F=CH_2CHISiMe$ (3)) in good yield. Under the same conditions, α,ω-fluoroalkylene diiodide($I(CF_2)_nI$, n=6(4a); n=4(4b)) reacted with 2 to form mono-adduct($I(CF_2)_nCH_2CHISiMe_3$(5)) and bis-adduct ($Me_3SiICHCH_2(CF_2)_nCH_2CHISiMe$(6)). The ratio of 5 to 6 depends on the amounts of 2 used. The reaction can be suppressed by hydroquinone and inhibited partially with p-dinitrobenzene. All the results seem to indicate that the reaction is a radical chain process induced by electron transfer. Stereospecific synthesis of trans-fluoroalkylvinylsilane($R_FCH=CHSiMe$ (7)) can be achieved by the reaction of 3 and diethylamine. On treatment of 3 with potassium hydroxide a trans- and cis-mixture of 7 was formed, which can be converted to pure trans-7 on treatment with a small amount of bromine in metylene chloride.