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DONOR-ACCEPTOR COMPLEXES FORMED BY PERFLUOROALKYL IODIDES WITH AMINES

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A series of liquid donor-acceptor complexes were formed between $I(CF_2)_2I$ (1), $Cl(CF_2)_2I$ (2) or $Cl(CF_2)_nI$ (n=4,6) and n-butylamine,triethylamine or diethylamine at room temperature. The fluorine resonances in $-CF_2I$ are markedly shifted upfield and in $-CF_2Cl$ only slightly compared to the liquid halide. A white crystal(m.p.90°C) was preciptated immediately when 1 was treated with morpholine in water or without solvent. It was identified as a 1:2 donor-acceptor complex by elemental analyses, MS, infrared, far-infrared, ^1H, ^{19}F NMR spectra and XPS. This complex thermally decomposed at about 104°C to yield mainly tetrafluoroethylene. Heating the solid complex in acetone, acetonitrile or DMF containing water or in water alone gave tetrafluoroethylene and $HCF_2CON\langle\rangle O$. N,N,N',N'-tetramethylethylenediamine reacted with 1 or $I(CF_2)_6I$ at room temperature without solvent to give the solid donor-acceptor complexes in ratio of 1:1 (m.p. 106.5°C and 103°C respectively). Interestingly, mixing dioxane with 1 at room temperature also afforded 1:1 donor-acceptor complex(m.p. 50-51°C). The mechanism of the formation of the complexes is discussed.