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HIGHLY FLUORINATED HIGH NITROGEN COMPOUNDS

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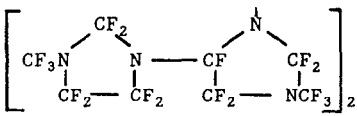
Compounds that contain large amounts of nitrogen concomitantly with polyfluoroalkyl and perfluoroalkyl substituents normally are inert materials that exhibit excellent hydrolytic and thermal properties. We have reported the synthesis of a variety of new polyfluoroalkyl and perfluoroalkyl secondary and tertiary amines, tetraazanes, and highly fluorinated-nitrogen heterocycles [1]. Currently, repeated chlorofluorination and photolysis reactions of the rather intractable $CCl_2{=}NCCl_2CCl_2N{=}CCl_2$ have led us through a variety of new compounds to the new stable hydrazine,



Just as is the case for $R_fN{=}SF_2$ and $R_fN{=}CF_2$, bis(polyfluoroalkoxy)sulfimides and bis(polyfluoroalkoxy)carbimides behave differently under similar reaction conditions, viz.,

$$R_fN{=}S(OR_f')_2 \xrightarrow[T]{ClF} R_fNCl_2 + (R_f'O)_2SF_4 \quad [2]$$

$$R_fN{=}C(OR_f')_2 \xrightarrow{ClF} \begin{cases} \xrightarrow{>-78\ ^\circ C} R_fNCl_2 + CF_2(OR_f')_2 \\ \xrightarrow{<-78\ ^\circ C} R_fN(Cl)CF(OR_f')_2 \end{cases}.$$

New diethers as well as polynitrogen compounds are possible based on the latter reaction.

1 G. Sarwar, R. L. Kirchmeier, and J. M. Shreeve, Inorg. Chem. 28, (1989); 28, (1989); 29, (1990).

2 H. M. Marsden and J. M. Shreeve, Inorg. Chem., 26, 169 (1987).