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PERFLUOROALKYL COMPOUNDS OF CADMIUM AND ZINC: SYNTHESIS AND REACTIONS

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$(CF_3)_2Hg$ is known to react with $(CH_3)_2Cd$ or $(CH_3)_2Zn$ to give $(CF_3)_2Cd$ and $(CF_3)_2Zn$ respectively [1,2].
We obtained perfluoroalkyl compounds of Cd and Zn in quantitative yields by reacting the corresponding perfluoroalkyl iodides with R_2M. The presence of complexing agents like e.g. diglyme is necessary to induce the reaction and to stabilize the resulting compounds:

$$R_2M + R_fI + D \longrightarrow R_fMR \cdot D + RI$$
$$\downarrow + R_fI$$
$$(R_f)_2M \cdot D + RI$$

M = Cd: R = CH_3, C_2H_5; R_f = CF_3, C_2F_5, n-C_3F_7, i-C_3F_7, n-C_4F_9, C_6F_5, CF_3CH_2.

M = Zn: R = CH_3, C_2H_5; R_f = CF_3, C_2F_5, C_6F_5.

D = glyme, diglyme, 2 CH_3CN, 2 pyridine.

The ^{19}F, ^{13}C and ^{113}Cd n.m.r. data will be discussed.

The properties and some selected reactions of $(R_f)_2Cd$, e.g. with $(CH_3)_3MOCOCF_3$ (M = Si, Sn, Pb) will be reported and underline the carbanionic nature of the R_f group.

The thermal decomposition of $(CF_3)_2Cd \cdot$diglyme and $(CF_3)_2Zn \cdot$diglyme results in the formation of $:CF_2$, which was identified by means of IR matrix spectroscopy.

1 L.J. Krause, J.A. Morrison, Inorg. Chem. 19, 604 (1980).
2 E.K.S. Liu, Inorg. Chem. 19, 266 (1980).