SYNTHESIS AND REACTIONS OF PERFLUORINATED DIAMOND-OIDS AND THEIR DERIVATIVES

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The Aerosol Direct Fluorination process has proved itself to be a powerful method for the synthesis of perfluorocarbons from hydrocarbons. Nowhere has this method's exceptional utility been more clearly demonstrated than in the synthesis of polycyclic, nonaromatizable cage compounds. The essential presence of sodium fluoride as substrate support substantially reduces both the protonic and lewis acidity of the endogenously generated hydrogen fluoride. This has resulted in synthesis of perfluorocarbon cage compounds having solely the intact, unrearranged skeleton of the parent molecule. The synthesis of perfluorinated diamantane and numerous substituted, perfluorinated adamantanes have been previously reported.[1] Additionally methods for the synthesis of specific functional derivatives in the diamond-oid family and their chemistry will be discussed.

The synthesis of perfluoroadamantone in good yields from adamantone has resulted in an interesting study of its chemistry with the nucleophiles: HOH, and ROH. The photochemistry of perfluoroadamantone has resulted in the facile extrusion of carbon monoxide and the synthesis of perfluoronoradamantane. The mechanism of this process appears to be radical in nature, however, entrapment of the intermediate radicals have proved difficult.

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[1] J. L. Adcock, H. Luo, S. B. Mathur and S. S. Zuberi, *Ninth European Symposium on Fluorine Chemistry*. Leicester UK, September 3-8, 1989.