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NOVEL FLUORINATE NON-METAL COMPOUNDS DERIVED FROM STRONG OXIDIZERS

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Nearly all fluorochemicals are derived indirectly from CaF_2 , which is the main fluoride source for the production of HF. From HF, the vast majority of all known fluorinated compounds can be synthesized without recourse to elemental fluorine. However, the syntheses of many interesting and important compounds do require elemental fluorine or strong oxidizers requiring elemental fluorine for their syntheses. The latter category has been the focus of our research in fluorine chemistry.

Some examples of chemistry which begin with elemental fluorine will be presented. These will include reaction sequences which involve the initial transformations; 1. F_2 to O-F to O-O, 2. F_2 to Cl-F to O-Cl, and 3. F_2 to Cl-F to N-Cl. These sequences are the basis for the synthesis of a variety of novel fluorochemicals.

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STABILIZING HIGH-OXIDATION STATE CATIONS

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Cations of high electron affinity (e.g. Xe^+ , ReF_6^+ , C_6F_6^+ , and highly oxidized graphite) require anions of high ionization potential for the salt containing the cation to be stable with respect to electron transfer from anion to cation. But even with anions of very high ionization potential (such as SbF_6^-) transfer of F^- to the cation may occur. Electron-oxidizer salts of O_2^+ , KrF^+ , C_6F_6^+ can be exploited to generate thermodynamically unstable salts particularly if the counter anions are very weak fluorobases. Although hexafluorides such as IrF_6 and PtF_6 are powerful electron oxidizers their MF_6^- ions give up F^- to strong acids such as ReF_6^+ . Some recent fluoride-ion and electron affinity evaluations will be included in the survey.