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ReF₇ AND ReOF₅ AS FLUORIDE ION DONORS

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Salts containing the ReF₆⁺ ion have been prepared by one-electron oxidation of ReF₆ using KrF⁺ salts. The compounds ReF₆⁺MF₆⁻ (M = Au, Sb) are of moderate stability, tending to decompose to ReF₇ and the corresponding pentafluoride. This gives rise to isolated ReF₇ and MF₅ molecules within the ionic lattice, whose presence is demonstrated by Raman spectroscopy. Interaction of ReF₆ and PtF₆ produced not the salt ReF₆⁺PtF₆⁻ (1), but rather the deep red (PtF₅)₄ when PtF₆ was present in excess, and PtF₄ when ReF₆ was in excess. ReF₆ and IrF₆ appear to be in equilibrium with ReF₇ and (IrF₅)₄, possibly via an ionic intermediate ReF₆⁺(IrF₆·xIrF₅)⁻.

The salts ReOF₄⁺MF₆⁻ (M = As, Au, Sb) have been characterized. In contrast to the behaviour of IOF₅ and IF₇, ReOF₅ is a better fluoride ion donor than ReF₇.

- 1 E. Jacob and M. Fahnle, Angew. Chem. **88**, 190, (1976).

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FLUORIDE ION DONOR PROPERTIES IN UOF₄

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Recently the adducts UOF₄·nSbF₅ (n = 1-3) were obtained from the reaction of UOF₄ with SbF₅ in SbF₅ or HF solvents and the structure of the 1:2 compound was described in terms of a fluorine-bridged network but with some contribution to the bonding from the ionic formulation [U^{VI}OF₂][Sb^VF₆]₂.

Reaction of UOF₄ with the Lewis Acid pentafluorides, BiF₅, TaF₅ and NbF₅, in anhydrous HF solvent or by fusing together UOF₄/MF₅ mixtures, also yields fluorine-bridged adducts, UOF₄·2BiF₅, UOF₄·3TaF₅ and UOF₄·3NbF₅, and it has been shown that, in these complexes too, UOF₄ exhibits weak fluoride ion donor properties.

The ternary adducts UOF₄·mSbF₅·nCH₃CN (m = 1,2; n = 2,6 respectively) and UF₅·xSbF₅·yCH₃CN (x = 1,2; y = 2,5 respectively) have been prepared by the reaction of dry acetonitrile with the appropriate binary adduct.