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OXIDATION OF TELLURIUM BY HIGH OXIDATION STATE FLUORIDES IN ACETONITRILE

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Elemental I_2 is oxidised by either MoF_6 or UF_6 in MeCN at ambient temperature to give solid $[I(NCMe)_2][MF_6]$, M = Mo or U [1]. Bromine under similar conditions is oxidised by UF_6 to give $[Me\text{-}\overbrace{C=N\text{-}(Me)C=N\text{-}(Me)C=N}\text{-}Br]\cdot[UF_6]$ in which 'positive' Br is bound to a -C=N- trimer [2]. A third type of cation is formed by oxidation of Te using either MoF_6 or UF_6. The products are crystalline solids which are formulated on the basis of their analyses, ^{125}Te n.m.r., vibrational and electronic spectra as $[TeF_3(NCMe)_2][MF_6]$, $3MF_5.NCMe$, M = Mo or U. Similar reactions occur between Mo or W metals and MoF_6 or WF_6 to give $MF_5.NCMe$ and this aided the characterisation of the Te-containing salts. Although SbF_5 and AsF_5 are strong oxidising agents in acidic media [3], the complexes SbF_5NCMe and $AsF_5.NCMe$ are weak oxidising agents in MeCN. Oxidation of Te by these species is limited to the formation of Te_4^{2+}. The NO^+ cation shows intermediate behaviour hence the order of oxidising ability experimentally established in MeCN is $UF_6 > MoF_6 > NO^+ > SbF_5.NCMe, AsF_5.NCMe$.

1 G.M. Anderson and J.M. Winfield, J.Chem. Soc., Dalton Trans., 337 (1986).

2 L. McGhee, D.S. Rycroft and J.M. Winfield, J. Fluorine Chem., **36**, 351 (1987).

3 e.g. T.A. O'Donnell, Chem. Soc. Rev., **16**, 1 (1987).