I-13

A MULTINUCLEAR MAGNETIC RESONANCE STUDY OF $TeF_x(OTeF_5)_{4-x}$, $[TeF_x(OTeF_5)_{3-x}]^+[AsF_y(OTeF_5)_{6-y}]^-$ AND $Cs^+[As(OTeF_5)_6]^-$

M. J. Collins and G. J. Schrobilgen*

Department of Chemistry, McMaster University, Hamilton, Ont. L8S 4M1 (Canada)

The $[OTeF_5]^-$ and F^- acceptor properties of AsF_5 and $As(OTeF_5)_5$ have been investigated for the series $TeF_x(OTeF_5)_{4-x}$, resulting in the mixed series $[TeF_x(OTeF_5)_{3-x}]^+[AsF_y(OTeF_5)_{6-y}]^-$. The latter anions and cations have been studied in solution using ^{19}F and ^{125}Te NMR spectroscopy. Pure $Te(OTeF_5)_4$ also reacts with $As(OTeF_5)_5$ to give $[Te(OTeF_5)_3]^+[As(OTeF_5)_6]^-$ which has also been characterized by Raman spectroscopy. The interaction of $Cs^+[OTeF_5]^-$ or $[(CH_3)_4N]^+[OTeF_5]^-$ with $As(OTeF_5)_5$ in CH_3CN yields the $[As(OTeF_5)_6]^-$ anion. The quadrupolar ^{75}As atom (I = 3/2, 100% natural abundance) $[As(OTeF_5)_6]^-$ possesses cubic local symmetry, permitting the observation of the ^{75}As resonance and a two-bond ^{125}Te-^{75}As spin-spin coupling in the ^{75}As and ^{125}Te spectra. The $[As(OTeF_5)_6]^-$ anion represents one of only a few examples with suitable symmetry which can be observed by ^{75}As NMR spectroscopy.