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STRUCTURES OF FLUORINE-CONTAINING COMPLEXES

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Incorporation of fluorine into ligands influences the steric and electronic properties of the ligands and the resultant complexes. The paper will describe X-ray crystal structure determinations on a series of complexes and will compare the structures determined with structures deduced from n.m.r. studies.

$[(C_6F_5)_3P]_2PtI_2$ (A) shows distortion from planar geometry about the platinum and intermeshing of the phenyl rings and the iodide. The solid state conformation is not that deduced from solution n.m.r. measurements.

The structures of three dithioether complexes of platinum(II), $[CF_3SCH_2CH(CH_3)SCF_3]_2PtCl_2$ (B); $[CH_3SCH_2CH(CF_3)SCH_3]PtCl_2$ (C); $[CH_3SCH(CF_3)CH(CF_3)SCH_3]PtCl_2$ (D) have been determined. In each case the conformation of the most likely isomer had been predicted from solution n.m.r. measurements and by use of molecular models and the conformation has been confirmed by X-ray crystallography. The effect of CF_3 -groups on the bonding will be discussed. As determined from Pt-S bond lengths the CF_3 -group reduces σ -donation from the sulphur and there is not thought to be significant π -bonding effects.

$[CH_3SCH_2CH(CF_3)SCH_3]PtCl_4$ (E) shows strong steric effects but the conformation found is that which should have greatest steric effects and thus be least abundant.

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SYNTHESIS, P.E. SPECTRA AND ELECTROCHEMISTRY OF TRANSITION METAL-FLUOROPHOSPHINE COMPLEXES

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He(I) (and in some cases He(II)) P.E. Spectra of a variety of transition metal-trifluorophosphine complexes will be presented and discussed and the data compared with related metal carbonyl compounds. The P.E. spectra of $M(CO)_x(PF_3)_{6-x}$ ($M=Cr, Mo$) will also be presented. Reversible one electron oxidation potentials E_{ox}^1 for a series of closed shell fluorophosphine complexes $Cr(CO)_5L$ (L =fluorophosphine and related ligands) and the influence of L on the energy of the h.o.m.o. will be discussed. Fluorophosphines studied include PF_2NH^tBu , PF_2NMe_2 , $MeN(PF_2)_2$, $(PFN^tBu)_2$ and $[O]PF_2$.