

Ph<sub>3</sub>RADIOTRACER INVESTIGATION OF THE INTERACTIONS BETWEEN [<sup>18</sup>F]- AND [<sup>35</sup>S]-  
LABELLED SF<sub>4</sub> AND SOME LEWIS ACID FLUORIDES

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Evidence for the nature and the extent of the interaction between gaseous SF<sub>4</sub> and the solid Lewis acids (NbF<sub>5</sub>)<sub>4</sub>, (TaF<sub>5</sub>)<sub>4</sub>, AlF<sub>3</sub>, and CrF<sub>3</sub> at room temperature has been obtained by using <sup>18</sup>F and <sup>35</sup>S as radiotracers. The results obtained show that, in each case, a weakly adsorbed SF<sub>4</sub> species is formed and that <sup>18</sup>F exchange occurs. Exchange is complete within 1 h at room temperature for (NbF<sub>5</sub>)<sub>4</sub> and (TaF<sub>5</sub>)<sub>4</sub>, and is substantial in the case of the trifluorides. In no case is a permanently retained species observed. The behaviour contrasts with that of SF<sub>4</sub> towards CsF where SF<sub>5</sub><sup>-</sup> is formed but <sup>18</sup>F exchange is not observed (K.W. Dixon and J.M. Winfield, J. Fluorine Chem., 29, 1985, 355). A third type of behaviour is observed between SF<sub>4</sub> and β-UF<sub>5</sub>. <sup>18</sup>F exchange has been reported previously in this system (D.K. Sanyal and J.M. Winfield, J. Fluorine Chem., 24, 1984, 75) and <sup>35</sup>S experiments show that a permanently retained species is formed. Possible formulations for SF<sub>4</sub> adsorbed on the solid fluorides will be discussed.

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