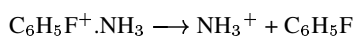
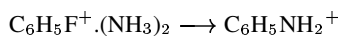


## IONIC REACTIVITY OF SMALL GAS PHASE MOLECULAR CLUSTERS

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The study of ionised molecular clusters provides an insight into ion-molecule chemistry; ubiquitous in atmospheric, flame and plasma processes. The neutral fluorobenzene-ammonia system, essentially unreactive in the gas phase, will react in solution under high temperature and pressure conditions. However, fluorobenzene<sup>+</sup> will react, via nucleophilic substitution to form aniline<sup>+</sup> and HF. In combination with the acquisition of REMPI spectra, we have observed the following reactions, post-ionisation, of fluorobenzene<sup>+</sup>-(NH<sub>3</sub>)<sub>n</sub> (n=1,2) clusters:



While nucleophilic substitution satisfactorily accounts for the formation of aniline<sup>+</sup>, it is more difficult to rationalise the formation of NH<sub>3</sub><sup>+</sup> on thermodynamic grounds. By performing *ab initio* calculations we hope to be able to postulate a mechanism for this reaction.