ROTATIONAL SPECTROSCOPY OF PRE-REACTIVE MULLIKEN COMPLEXES OF HALOGENS WITH LEWIS BASES.

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Ground-state rotational spectra of a series of pre-reactive complexes B$\cdots$XY, where B is a Lewis Base and XY is a halogen or interhalogen molecule, have been observed. Complexes were formed, rapidly isolated and their spectra recorded before chemical reaction could occur between the components. To achieve this, a fast-mixing nozzle was used in combination with a Balle-Flygare F-T microwave spectrometer. Conclusions about the nature of the intermolecular interaction derived from analyses of the spectroscopic constants will be presented. In particular, an attempt will be made to answer the following question: Is it possible by careful choice of B and XY to identify examples of both types of Mulliken complex in the gas phase, namely those of the weak, outer type B$\cdots$XY and those of the strong, inner type $[BX]^+ \cdots Y^-$ with significant charge transfer?