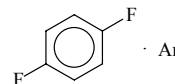


700 **C₆H₄ArF₂**
Mass-selective REMPI

1,4-Difluorobenzene – argon (1/1)
p-Difluorobenzene – argon (1/1)
(weakly bound complex)

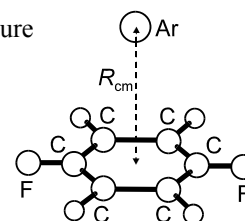
C_{2v}
(effective symmetry class)
(large-amplitude motion)

State	\tilde{X}^1A_1	\tilde{A}^1B_2
Energy [eV]	0.00	4.564
$r_0(R_{cm})$ [Å]	3.55(2)	3.49(2)



The van der Waals complex was generated by expanding a mixture of 1% *p*-difluorobenzene in argon into a supersonic chamber. Excitation from the ground state to a selected rovibronic level

of the \tilde{A} state was achieved by a single frequency UV laser with a frequency width of 60 MHz. A counterpropagating ionization laser with lower power produced ions which were analyzed in a time-of-flight mass spectrometer. Rotational analysis of the spectra yielded rotational constants for the ground and excited states of the complex. These constants are consistent with a structure in which the Ar atom lies 3.55 Å above the plane of the *p*-difluorobenzene molecule in the ground state and 3.49 Å above the plane of the ring in the excited state.



Sussmann, R., Neusser, H.J.: J. Chem. Phys. **102** (1995) 3055.

RCS

State	\tilde{X}^1A_1	\tilde{A}^1B_2
Energy [eV]	0.00	(4.567) ^a
$r_0(R_{cm})$ [Å]	3.543(17)	3.486(9)

The van der Waals complexes was generated by expanding a mixture of *p*-difluorobenzene at its vapor pressure at room temperature and 600 mbar argon into a vacuum chamber. The mixture was then irradiated with a tunable UV picosecond laser system. The solid-state laser system delivered pump and probe laser pulses of duration 3 ps with a variable delay of up to 8 ns. The laser-induced fluorescence was filtered and imaged onto a photomultiplier and recorded with a box-car integrator at a function of the time delay. In order to increase the signal-to-noise ratio a pulse-to-pulse polarization switching setup was employed using a UV Pockels cell for the pump pulse. The wavelength was computer-controlled and was continuously tunable from 250 to 400 nm. The principal rotational constants for the ground and excited states are derived from the recurrence times of features in the signals observed. The center of mass distances from the F atoms to the *p*-difluorobenzene plane are deduced from *C* rotational constants.

^a) Approximate.

Weichert, A., Riehn, C., Matylitsky, V.V., Jarzeba, W., Brutschy, B.: J. Mol. Struct. **612** (2002) 325.