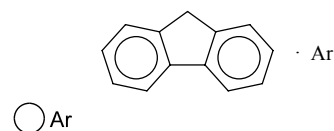
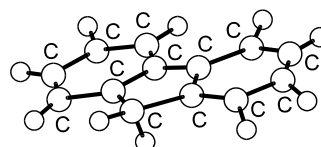


915
LIF $C_{13}H_{10}Ar$ **9H-Fluorene – argon (1/1)**
(weakly bound complex) C_s
(effective symmetry class)
(large-amplitude motion)

State	\tilde{X}^1A'	\tilde{A}^1A''
Energy [eV]	0.0	4.182
$r_0(C_{13}H_{10}\dots Ar)$ [Å]	3.42(3)	3.42(3)
Reference	[1]	[1]



A molecular beam was formed by expanding a mixture of 1% fluorene and argon through a supersonic nozzle. Fluorescence was excited by a frequency doubled dye laser, collected using spatially selected optics and detected by a photomultiplier and photon counting system.



Rotational analyses of the spectra yield rotational constants for the ground and the excited states of the complex. From these values the coordinates of the Ar atom with respect to the principal axes of the fluorene molecule are found to be $x = 0.53(7)$, $y = 0$, $z = 3.42(3)$ Å. The sign of x is not determined. The large-amplitude motions of the argon atom in the complex prevent a determination of the change in the structure of the molecule upon electronic excitation. Further studies with fully-deuterated fluorene $C_{13}D_{10}$ and argon [2] fail to alleviate these problems.

[1] Meerts, W.L., Majewski, W.A., van Herpen, W.M.: Can. J. Phys. **62** (1984) 1293.

[2] van Herpen, W.M., Meerts, W.L.: Chem. Phys. Lett. **147** (1988) 7.