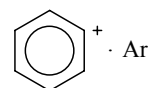


716 **C₆H₆Ar⁺**

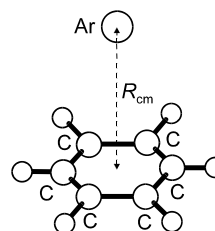
Mass-selective REMPI

Benzene cation – argon (1/1)Benzene (1+) ion – argon (1/1)
(weakly bound complex)**C_{6v}**(effective symmetry class)
(large-amplitude motion)

State	\tilde{X}^2E_2
Energy [eV]	9.223
$r_0(R_{\text{cm}})$ [Å]	3.513(3)



The van der Waals complex was generated by expanding a mixture of 1% benzene 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 fixed single frequency UV laser. Further excitation to high Rydberg levels close to the ionization limit ($n > 40$) was achieved using a second counterpropagating tunable UV dye laser. Both lasers generated 15 ns pulses. 10 ns after laser excitation a pulsed electric field was switched on to field-ionize the Rydberg states. The resulting ions were analyzed in a time-of-flight mass spectrometer. Rotational analyses of the Rydberg spectra yielded rotational constants which indicate that the Ar atom lies on the 6-fold axis of symmetry. From the B -rotational constants of the complex and of the benzene positive ion, the distance of the Ar atom from the plane of the benzene positive ion is deduced. When C₆D₆ is used the Ar atom is found to lie 3.497(3) Å from the ring.



Siglow, K., Neuhauser, R., Neusser, H.J.: J. Chem. Phys. **110** (1999) 5589.