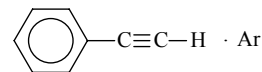


821 **C₈H₆Ar**
Mass-selective REMPI

Phenylacetylene – argon (1/1)
Ethynylbenzene – argon (1/1)
(weakly bound complex)

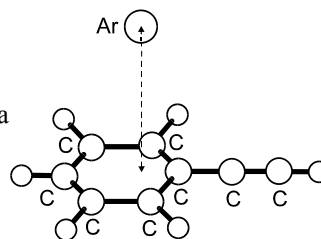
C_s
(effective symmetry class)
(large-amplitude motion)



State	\tilde{X}^1A'	\tilde{A}^1A''
Energy [eV]	0.0	4.445
$r_0(\text{C}_8\text{H}_6 \dots \text{Ar})$ [Å]	3.51	3.45

The van der Waals complex was generated by expanding a mixture of 1% phenylacetylene 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 produces ions which were analyzed in a time-of-flight mass spectrometer. Rotational analyses of the spectra yielded rotational constants for both the ground and the excited states of the complex. For the ground state these constants are consistent with a structure in which the Ar atom lies 3.51 Å above the plane of the phenylacetylene molecule and displaced from the center of the phenyl ring by 0.28 Å in the direction of the acetylenic substituent. For the excited state the corresponding distances are 3.45 and 0.38 Å.



Siglow, K., Neusser, H.J.: Chem. Phys. Lett. **343** (2001) 475.