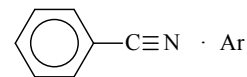


774 **C₇H₅ArN**
Mass-selective REMPI

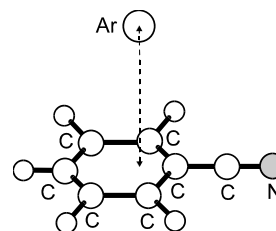
Benzonitrile – argon (1/1)
(weakly bound complex)

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

State	\tilde{A}^1A''
Energy [eV]	4.524
$r_0(\text{C}_7\text{H}_5\text{N}\dots\text{Ar})$ [Å]	3.48(1)



The van der Waals complex was generated by passing argon over a heated reservoir of fluid benzonitrile and expanding the mixture 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 excited state of the complex. These constants are consistent with a structure in which the Ar atom lies 3.48 Å above the plane of the benzonitrile molecule and is displaced from the center of the phenyl ring by 0.32 Å in the direction of the cyano substituent.



Helm, R.M., Vogel, H.-P., Neusser, H.J.: Chem. Phys. Lett. **270** (1997) 285.

[II/25D \(3, 2420\)](#)