

736 **C₆H₈O₂**

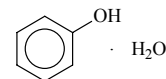
Mass-selective REMPI

Phenol – water (1/1)

(weakly bound complex)

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

State	\tilde{X}^1A'	\tilde{A}^1A''
Energy [eV]	0.00	4.463
$r_s(O\cdots H)$ [Å]	1.87(14)	1.82(23)

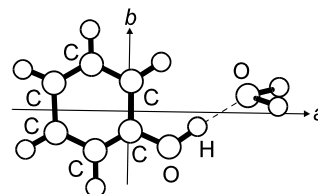


The van der Waals complex was generated by passing a mixture of argon and water over heated phenol and expanding the mixture into a supersonic chamber. The experiment was repeated with C₆H₅OD and D₂O. Excitation from the ground state to a selected

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.

The spectra were found to consist of 17% *a*- and 83% *b*-type transitions. Rotational analyses of the spectra yield rotational constants for the ground and excited states. By assuming that the molecular geometries of the phenol and water molecules are not changed by complex formation, the distances of the oxygen atom in the water molecule from the phenolic hydrogen atom are determined using Kraitchman's relations. The water molecule lies in a plane perpendicular to the phenol ring.



Helm, R.M., Neusser, H.J.: Chem. Phys. **239** (1998) 33.

[II/25D \(3, 2288\)](#)