

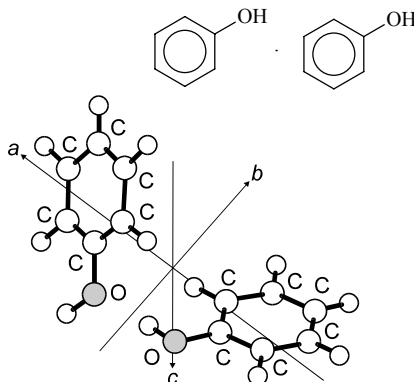
908 **C₁₂H₁₂O₂**
RCS-TRFD

Phenol dimer
(weakly bound complex)

C₁
(effective symmetry class)
(large-amplitude motion)

Helium was passed over phenol at 60 °C and expanded through a heated nozzle into a vacuum chamber. Pump and probe UV pulses were generated from a Ti-sapphire laser system which pumped two parametric generators. The two beams passed through a Michelson interferometer in which the probe pulse was delayed by 8 ns. The two beams were aligned collinearly and focussed into the vacuum chamber. The fluorescence was collected and focussed onto a photomultiplier. A chopper, synchronized to half the repetition rate of the laser, was employed in the fixed arm of the interferometer. Several transients were identified in the fluorescence spectrum and

provided information on the rotational constants of the dimer in its ground and excited states. In fitting these data it was assumed that the geometries of the phenol moieties are the same as in the parent compounds. For the ground state the hydrogen-bonded structure shown in the diagram was obtained. The distance between the centers of mass of the two moieties is 5.255 ± 0.005 Å. When one of the moieties is excited this distance increases to 5.311 ± 0.045 Å. However, in the excited state it was impossible to determine a definitive structure.



Weichert, A., Riehn, C., Brutschy, B.: J. Phys. Chem. A **105** (2001) 5679.