

## DOUBLE-PROTON TRANSFER OVER A PHENYL RING REVEALED BY CP-FTMW SPECTROSCOPY

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Our previous work demonstrated that the measurement of pure rotational spectroscopy of “non-polar” dimer of formic acid can be achieved by means of asymmetric H–D substitution.[1] The concerted double proton transfer of the two hydroxyl hydrogens takes place between two equivalent minima and generates a tunneling splitting of 331.6(5) MHz. In this talk, I will discuss the double proton transfer over a phenyl ring in the complexes of formic acid dimer (FAD) with phenyl compounds. For example, in the FAD-fluorobenzene complex, the presence of fluorobenzene as a neighboring molecule does not quench the double proton transfer in the FAD but decreases its tunneling splitting to 267.608(1) MHz.[2] In the FAD-fluorobenzaldehyde complex, the protons transfer does not occur via tunneling, but produces two non-equivalent isomers. Our spectra show that the isotopic substitution at different atomic positions have different influences on the tunneling process. The experiments were carried out by using the CP-FTMW spectrometer in Hamburg and the new-build one in Shanghai. [1] *Angew. Chem. Int. Ed.* 2019, 58, 859–865. [2] *Angew. Chem. Int. Ed.* 2021, 60, 25674–25679.

