

The adsorption of acenes on rutile $\text{TiO}_2(110)$: A multi-technique investigation

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(Received 21 September 2001; accepted 22 January 2002)

The adsorption of benzene, naphthalene, and anthracene on the $\text{TiO}_2(110)$ surface has been investigated using near edge x-ray absorption spectroscopy (NEXAFS), x-ray photoelectron spectroscopy, and thermal programmed desorption. For all three adsorbates a planar adsorption geometry is found. In contrast to the bonding of benzene and larger acenes to metal surfaces, we find that the interaction is dominated by electrostatic forces between the adsorbed molecules and the $\text{TiO}_2(110)$ substrate. The fact that the average tilt angle between molecular and surface plane as determined by NEXAFS is substantially different from zero indicates the presence of defect species.

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