Abstract Submitted
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Water adsorption on $SrTiO_3$(001) studied by x-ray standing wave excited photoelectron spectroscopy JORG ZEGENHAGEN, VLADYSLAV SOLOKHA, AXEL WILSON, DAVID DUNCAN, DEBI GARAI, Diamond Light Source Ltd, KURT HINGERL, Johannes Kepler University Linz — We investigated the nature of water adsorption and in particular the H_2O and/or OH^- bonding sites on different $SrTiO_3$(001) surfaces using the powerful technique of standing wave excited photoelectron spectroscopy. This allowed us determining whether the H_2O adsorption is associative or dissociative and additionally localizing the exact bonding site of the different oxygen species (water oxygen and OH^- oxygen species). We deposited water in ultra high vacuum on several differently structured or reconstruction SrTiO3(001) surfaces in the range from $\sim$ 100K to room temperature. Our results provide valuable insight into water adsorption on STO(001) surfaces and its specific catalytic activity in view of water splitting applications. They also help clarify previous conflicting previous results [1,2]. [1] H. Hussain, X. Torrelles, P. Rajput, M. Nicotra, G. Thornton, J. Zegenhagen, J. Phys. Chem. C. 118, 10980 (2014). [2] A.E. Becerra-Toledo, M.R. Castell, L.D. Marks, Surf. Sci. 606 (2012) 762; A.E. Becerra-Toledo, j.a. Enterkin, D.M. Kienzle, L.D. Marks, Surf. Sci. 606 (2012) 791

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