

Probing acetone adsorption on SAM-functionalized ZnO nanowires through NAP-XPS

Speaker:

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Abstract

The working principle of gas sensors relies on the reversible adsorption/desorption process of a target molecule onto a material surface. Thus, to optimize these devices, a thorough understanding of the interactions that occur at the gas molecules-surface interface is required for any potential sensing material with a functionalized surface. In this seminar, I will deal with the adsorption mechanism of acetone on ZnO nanowires (NWs) functionalized with the self-assembly of (3-aminopropyl) trimethoxysilane (APTMS). This reaction mechanism is compared with the acetone adsorption on two reference systems using near-ambient pressure X-ray photoelectron spectroscopy (NAP-XPS). This study showed that the reversible bond formation between the target gas and the active sensing layer involves O and C atoms only. Furthermore, it has been demonstrated that the APTMS functionalization offers a larger number of active sites on the ZnO surface, and thus contributes to the superior performance of such a system as a gas sensor device from a chemical perspective.

PhD Seminar

25th January 2023

Sala Riunioni S5, 16.00

via Garzetta 48, Brescia

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