

## Anchoring of a dye precursor on p-type NiO(100) studied by RT nc-AFM

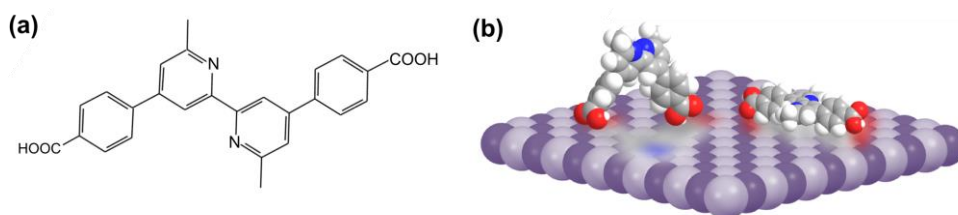
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The properties of metal oxides can be modified when functionalized with organic molecules. These kinds of surfaces have become important for enabling technologies such as hybrid photovoltaic p-type dye sensitized solar cells (DSSCs)<sup>1</sup>. Key parameters for optimization of the interfaces are the choice of the functionalization compounds and also the adsorption geometry of the molecules on the substrate. The latter predicates fundamental studies of such surface-molecule interactions at the nanoscale.

In this contribution, we describe the use of non-contact atomic force microscopy at room temperature to investigate the adsorption of the ligand ALC1 on the NiO(100) surface (see Fig.1). NiO is a p-type semiconductor with a large band gap of 3.6eV and is used in p-type DSSCs<sup>2</sup>. Depending on the degree of surface coverage, single molecules, groups of adsorbates with random or recognizable shapes, or even islands and domains can be identified. The interfaces were imaged with sub-molecular resolution, revealing that the anchoring ligand lies in a near-planar conformation on the surface. Furthermore, electrostatic interactions with the surface have been experimentally quantified by Kelvin probe force microscopy.



**Figure 1:** (a) Structure of ALC1. (b) Schematic of two different adsorption geometries of ALC1 on the NiO(100): standing cis-ALC1 and plana trans-ALC1

[1] He *et al.*, *J. Phys. Chem. B* **1999**, *103*, 8940-8943

[2] Wood *et al.*, *Phys. Chem. Chem. Phys.* **2016**, *18*, 10727

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