

# XPS and UPS valence band studies of nano- and polycrystalline Ni-Ti alloy thin films

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It is well known that modifications of the valence bands of the nanocrystalline alloys could significantly influence on their hydrogenation properties. In this contribution we study valence bands of in-situ prepared nano- and polycrystalline Ni-Ti alloy thin films using X-ray (XPS) and ultraviolet (UPS) photoelectron spectroscopy. Additionally, theoretical valence bands were calculated using ab initio methods. The structure and morphology of the samples have been studied by X-ray diffraction and atomic force microscopy, respectively. Furthermore, hydrogen absorption and desorption kinetics up to 1000 mbar were studied in Pd covered alloy samples using four-point resistivity measurements. Results showed that the valence bands of the nanocrystalline Ni-Ti alloy thin films are considerably broader compared to those measured for the polycrystalline samples with the same compositions.

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