

# Hydrogen adsorption on metal oxide surfaces: a reinvestigation using He-atom scattering

Ch Wöll

Physikalische Chemie I, Ruhr-Universität Bochum, 44780 Bochum, FRG, Germany

Received 4 May 2004

Published 9 July 2004

Online at [stacks.iop.org/JPhysCM/16/S2981](http://stacks.iop.org/JPhysCM/16/S2981)

doi:10.1088/0953-8984/16/29/012

## Abstract

In this paper we will present recent results obtained for hydrogen adsorbed on metal oxide surfaces using helium-atom scattering (HAS). The hydrogen adlayers were prepared by exposing clean and well defined metal oxide surfaces to either molecular or atomic hydrogen. The HAS measurements were complemented by LEED and x-ray photoelectron spectroscopy. The results reveal the formation of ordered H( $1 \times 1$ ) overlayers on rutile TiO<sub>2</sub>(110), the polar Zn–ZnO surface and ZnO( $10\bar{1}0$ ). On Al<sub>2</sub>O<sub>3</sub>( $11\bar{2}0$ ) exposure to atomic hydrogen did not lead to the formation of an ordered hydrogen adlayer, whereas on the polar O–ZnO surface the hydrogen lifted the ( $1 \times 3$ ) reconstruction seen for the clean surface.