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# Adsorption of hydrogen on the polar O–ZnO surface: a molecular beam study

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The interaction of atomic and molecular hydrogen with the polar oxygen-terminated ZnO(000-1) surface has been studied by He atom scattering, LEED, and He atom reflectivity measurements. Whereas the sticking coefficient $S_0$ for molecular hydrogen is so low that only an upper limit can be given ($S_0 < 3 \times 10^{-7}$), adsorption of atomic hydrogen leads to the formation of a H($1 \times 1$) adlayer. Prolonged exposure to H atoms induces a disordering of the surface. The desorption temperature of the adsorbed H atoms was determined by monitoring the reflectivity of the surface for the He atoms. Assuming that the activation energy for desorption is equal to the H atom binding energy and using a pre exponential factor of $10^{21}$ cm$^2$/(mol s) we yield a value of 163 kJ/mol for the H atom binding energy.