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Observation of CO_2 photodesorption from ZnO Nanowires under Ultraviolet illumination ZHIHUA SU, Department of Electrical and Computer Engineering, University of Houston, Houston, Texas 77204, USA, CARSTEN RONNING, SEBASTIAN GEBURT, Institute of Solid State Physics, University of Jena, Jena, Germany, ABDELHAK BENSAOULA, Department of Electrical and Computer Engineering and Department of Physics, University of Houston, Houston, Texas 77204, USA, JIMING BAO, Department of Electrical and Computer Engineering, University of Houston, Houston, Texas 77204, USA — Electrical and optical properties of ZnO nanowires were greatly affected by surface-related gas adsorption and photo-desorption process. Oxygen was widely accepted as photo-desorption species from ZnO surface for years, but the conclusion came from indirect evidence. In this report, residual gas analyzer was used to directly monitor gas signal inside the chamber in which ZnO nanowires grown by CVD method was placed, while 362nm UV laser pulse with 2 second duration time was used as light source. The results showed CO_2 not O_2, was photo-desorption species. The desorption rate decreased with increase of illumination time. 532nm laser was also used as comparison light resource, and results showed that only under above band-gap illumination could CO_2 photo-desorption happen. Photocurrent measurement was also employed in situ with photo-desorption experiments, and coordinate results were obtained. Above observation suggested an impurity carbon involved process under above bang-gap radiation that results in CO_2 desorption. This report provided experimental support for study on ZnO surface-related electrical and optical properties.

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