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Dimorphite based gas sensitive thin films

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Abstract

For the first time it was observed that thin films based on artificial dimorphite (As4S3) exhibit gas sensitivity at room temperature. A sandwich metal-semiconductor-metal (MSM) structure with dimorphite as the semiconducting material is used as chemical sensor for the detection of propylamine vapor. The gas induced shifts of the current–voltage characteristics as well as of the transient characteristics are studied. The interaction of propylamine vapor with dimorphite leads to an increase of the current, which indicates a gas induced doping effect. A dependence of the gas induced current on the applied voltage and on the gas concentration is found. Results are discussed in terms of gas controlled trapping of injected carriers from electrodes which influences the space charge limited current.