

Abstract Submitted
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Gas sensing response of nanostructured CoSb_2O_6 prepared by non-aqueous solution methods¹ CARLOS MICHEL, JUAN MORAN, HECTOR GUILLEN, ALMA MARTINEZ, Universidad de Guadalajara CUCEI Dep. Physics — Nanostructured CoSb_2O_6 , with trirutile type structure, was prepared by a non-aqueous solution-polymerization method, using antimony chloride, cobalt nitrate, polyvinyl pyrrolidone and ethyl alcohol. The evaporation, by microwave radiation, of the precipitate obtained in the initial stage of the synthesis, produced an amorphous solid precursor. Further calcination at 700°C yielded the target composition. X-ray powder diffraction was used to identify the crystal structure, which corresponds to tetragonal with cell parameters $a = 4.6544 \text{ \AA}$ and $c = 9.2823 \text{ \AA}$, and space group $P42_1/nm$. SEM and TEM were used to analyze particle size and shape; by TEM, nanostructured particles with shape of filaments with 20 nm diameter and length up to 600 nm were observed. Their local crystallinity was confirmed by selected area electron diffraction. To test CoSb_2O_6 as a gas sensor material, the powder was deposited on alumina substrates using the screen-printing technique. DC electrical characterization was performed in air, O_2 and CO_2 from room temperature to 600°C . The dynamic response of resistance characterization displayed a variation of about $1\text{k}\Omega$ when detecting CO_2 ; whereas for O_2 a change in the order of $10^2\Omega$ was measured.

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