Nanoporous tin oxide materials for the sub-ppm detection of formaldehyde in indoor air

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Abstract

Outstanding performances in the sub-ppm detection of indoor formaldehyde pollution were obtained when small amounts of zinc were introduced in tin oxides. Nanostructured Sn oxide-based porous materials doped with Zn or not, were synthesized using hydrothermal routes. Gas sensors were prepared using the aforementioned tin oxide materials and they exhibited a high sensitivity to formaldehyde at 230∘C, as well as a good repeatability over the time. Their limit of formaldehyde detection was as low as 8 ppb in dry air and 50 ppb in air with 60% RH at 25∘C.

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