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## Au functionalized ZnO rose-like hierarchical structures and their enhanced NO<sub>2</sub> sensing performance

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### ABSTRACT:

Herein, we present ZnO rose-like hierarchical nanostructures employed as support to Au nanoparticles to produce Au functionalized three dimensional (3D) ZnO hierarchical nanostructures (Au/ZnO) for NO<sub>2</sub> detection using a microwave-assisted method. Comparative analysis of NO<sub>2</sub> sensing performance between the pristine ZnO and Au/ZnO rose-like structures at 300 °C revealed improved NO<sub>2</sub> response and rapid response-recovery times with Au incorporation owing to a combination of high surface accessibility induced by hierarchical nanostructure design and catalytic activity of the small Au nanoparticles. Structural and optical analyses acquired from X-ray diffraction, scanning electron microscopy, transmission electron microscope and photoluminescence spectroscopy were also performed.