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# Synthesis, characterizations, photocatalytic and sensing studies of ZnO nanocapsules

M. Faisal<sup>a,\*</sup>, Sher Bahadar Khan<sup>a,b,c</sup>, Mohammed M. Rahman<sup>a</sup>, Aslam Jamal<sup>a</sup>,  
Abdullah M. Asiri<sup>b,c</sup>, M.M. Abdullah<sup>a</sup>

<sup>a</sup> Advanced Materials and Nano-Engineering Laboratory (AMNEL) and Centre for Advanced Materials and Nano-Engineering (CAMNE), Faculty of Science and Arts, Najran University, P. O. Box 1988, Najran, 11001, Saudi Arabia

<sup>b</sup> The Center of Excellence for Advanced Materials Research, King Abdulaziz University, Jeddah 21589, P.O. Box 80203, Saudi Arabia

<sup>c</sup> Chemistry Department, Faculty of Science, King Abdulaziz University, P. O. Box 80203, Jeddah 21589, Saudi Arabia

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### ABSTRACT

ZnO nanocapsules have been synthesized hydrothermally. The structural and morphological properties were investigated using X-ray powder diffraction (XRD), field emission scanning electron microscopy (FESEM), FTIR, Raman, EDS and UV–vis absorption spectroscopy. For the first time chemical sensing properties of the synthesized ZnO nanocapsules have been investigated by *I–V* technique, where chloroform is used as a target compound. The chloroform sensors show good sensitivity ( $0.478 \mu\text{A cm}^{-2} \text{mM}^{-1}$ ), lower detection limit ( $6.67 \mu\text{M}$ ), and large linear dynamic range (LDR,  $12.0 \mu\text{M}–12.0 \text{mM}$ ) with good linearity ( $R$ , 0.8523) in short response time. Additionally, photocatalytic activity of the prepared capsule shaped ZnO photocatalyst was evaluated by the degradation of acridine orange. Prepared ZnO nanocapsules possess high photocatalytic activity when compared with  $\text{TiO}_2\text{-UV100}$ .

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