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**Surface passivated pure Indium Oxide nanowires for gas sensors**

PRADEEP GALI, Department of Electrical Electrical Engineering, University of North Texas, KIRAN SHRESTHA, Department of Physics, University of North Texas, FANG LINGKUO, NIGEL SHEPHERD, Department of Materials science, University of North Texas, USHA PHILIPOSE, Department of Physics, University of North Texas — Indium oxide ( $\text{In}_2\text{O}_3$ ) nanowires have applications in semiconductor electronics and gas sensing. We report on growth of stoichiometric  $\text{In}_2\text{O}_3$  nanowires with diameter ranging from 40 to 80nm and lengths over 10  $\mu\text{m}$ . Structural characterization done with SEM, XRD and TEM shows that the nanowires exhibits BCC structure and grow along the (100) direction. Energy Dispersive X-ray spectroscopy shows stoichiometric composition. Transport measurements on a single nanowire shows ohmic behavior and a resistance of about 100 K $\Omega$ . Photoluminescence spectrum at room temperature shows strong emission peaks at 370nm and 415nm, corresponding to near band edge and defect related emission respectively. We present a technique of post-growth annealing of these nanowires to eliminate the defect induced emission and enhance band edge emission. Passivating the surface of these nanowires enhances their gas sensing abilities.

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