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Role of electrodeposition parameters on stoichiometry of InSb nanowires ABHAY SINGH, USHA PHILIPOSE, Department of Physics, University of North Texas, 1155 Union Circle, Denton, Texas 76203, USA — The effect of electrolyte pH on the properties of electrodeposited indium antimonide (InSb) nanowires grown in anodic alumina oxide (AAO) template will be presented. At a pH of 1.7, the InSb nanowires were found to be rich in antimony (Sb) and had rough surfaces. Though the surface and bulk of the InSb nanowire is intrinsically n-type, when InSb is grown as a Sb-rich material it shows p-type behavior, attributed to the Sb antisite and indium (In) interstitial defects. At low-pH, the effect of citrate ions on the electrodeposition is minimal, resulting in different deposition potential of In and Sb. The low pH favors adsorption of Sb anions, resulting in a high density of intrinsic defects in the nanowire. The p-type behavior was verified by measuring the electrical properties of a single InSb nanowire connected in a field-effect-transistor type configuration. The nanowires had a hole concentration of $\sim 1.910^{16} \text{ cm}^{-3}$ with a field effect hole mobility of $\sim 507 \text{ cm}^2\text{V}^{-1}\text{s}^{-1}$, and high on-off current ratio of the order of 10^3 .

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