Abstract Submitted
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The effect of bismuth surfactants on the group V incorporation in InAsSb[1] EVAN ANDERSON, Materials Science and Engineering, University of Michigan, Ann Arbor, MI 48109, WENDY SARNEY, STEFAN SVENSSON, Army Research Lab, Adelphi, MD 20783, ADAM LUNDQUIST, JOANNA MILLUNCHICK, Materials Science and Engineering, University of Michigan, Ann Arbor, MI 48109, CHRIS PEARSON, Computer Science, Engineering, and Physics, University of Michigan-Flint, Flint, MI, 48502 — Bismuth is a well known surfactant for strained heteroepitaxial growth in compound semiconductors, however, its effect on the incorporation of different species in alloy systems is not well understood. In this work, we investigate the role of a Bi surfactant on the composition and morphology of lattice-matched InAsSb/GaSb as a function of Bi flux and growth temperature. Rutherford Backscattering Spectrometry confirmed that no Bi was incorporated for Bi fluxes up to 4.94e-7 torr. High resolution x-ray diffraction (XRD), on the other hand, showed that the Sb composition decreased with increasing Bi flux or increasing substrate temperature. XRD also indicates that, for a constant Bi flux, Bi has a diminishing effect on film composition as the substrate temperature is increased. Atomic Force Microscopy shows that the surface RMS roughness tended to increase with increasing Bi flux, though this may be due to the fact that these films are further from the lattice matching condition due to reduced Sb incorporation. We speculate that the decrease in Sb incorporation may be a result of a stronger As-Bi interaction energy.

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