

Abstract Submitted
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Investigation of InBi intermetallic compounds as possible topological insulators Y.T. LIN, Q.Y. CHEN, W.C. HSEIH, C.F. CHANG, F.C. CHUANG, National Sun Yat-Sen University, H.H. LIAO, Enli Technology Inc., Kaohsiung, Taiwan — InBi intermetallic compounds were found to be potentially 2-dimensional topological insulators from first-principle calculations. In our experiment, InBi, In₂Bi₃ and In₃Bi₅ were fabricated either in bulk or thin film, by depositing In and Bi into 2 layers by e-beam evaporation of proper thickness ratios for each stoichiometry. The bi-layers were rapid thermal annealed to accomplish the reaction or intermixing well above their temperatures of phase transition. EDS and secondary electron imaging were used to determine the obtained stoichiometry. CVD using a 3-zone furnace was as tested with various combinations of zone temperatures, types and flow rates of carrying gases to investigate the feasibility of epitaxial growth. Samples were characterized by XRD to obtain the crystalline phase, magneto-transport measurements to determine the carrier concentration and mobility using a PPMS to correlate the measured results. We will ponder on the implication of our findings in regards to the possibilities of being a candidate for topological insulator as predicted by the calculations.

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