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Electrical Properties and Crystallographic Characterization of Ho₂O₃ Doped Bi₂O₃ Polymorphs.

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The main aims of this study are to determine new phases of bismuth trioxide holmium trioxide binary system and the temperature dependence of the electrical transport properties. The reaction products obtained in an open air atmosphere were characterized by x-ray powder diffractions (XRD) and the unit cell parameters were calculated from the diffraction patterns. The α - β -Bi₂O₃, β -Bi₂O₃ and β - δ -Bi₂O₃ crystal systems were obtained by doping 0,01 < %Ho₂O₃ < 0,02 mole, 0,02 < %Ho₂O₃ < 0,09 mole and 0,09 < %Ho₂O₃ < 0,1 mole, respectively. Thermal behavior and thermal stability of the phases were investigated by using thermal analysis techniques. Surface and grain properties of the related phases were determined by making SEM analysis. The empirical formula of the synthesized solid solutions was determined by elemental analysis. The temperature dependence of the electrical properties of β -Bi₂O₃ solid solution was measured by using four point probe method.

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