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Superconductivity and Magnetism in In_2O_3-ZnO Observed in Bulk and Nano Samples ROBERTO ESCUDERO, FRANCISCO ASCENCIO, IIM-UNAM, KARLA HERNANDEZ, Universidad de Sonora, Mexico — We prepared and studied compounds with In_2O_3 powders and ZnO nanoparticles. Samples were prepared under different stoichiometric conditions and reacted at different temperatures. The initial temperatures where the oxides are mixed were in the range of 300 °C, final temperatures are close to 1100 °C. Samples were annealed in oxygen and argon atmospheres. The resulting black compounds present superconducting behavior with maximum transition temperatures above 4.5 K. Magnetic measurements show bulk superconducting diamagnetism to the maximum value about -1/4π. This type II superconducting material presents a critical magnetic file H_{C1} of 55 Oe and $H_{C2}$of 345 Oe, at 1.7 K. Isothermal magnetic measurements, below and above the superconducting transition temperature show that the compounds are also ferromagnetic.

Roberto Escudero
IIM-UNAM

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