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THICKNESS DEPENDENCE ON FERROMAGNETIC Fe DOPED Zn-Mg-Fe-O FILM

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Fe doped Zn-Mg-Fe-O thin films were prepared by rf-magnetron sputtering with substrate temperature at 500 °C on Si(100) and were annealed at 550 °C for 1 hour in Ar atmosphere. The thickness of Zn-Mg-Fe-O films were found to be about 600 ~ 800 Å by cross section images for scanning electron microscope. The structure, electric and magnetic properties with Zn-Mg-Fe-O films have been studied by x-ray diffraction, x-ray photoemission spectroscopy, vibrating sample magnetometer, atomic force microscope, and temperature dependence of resistance measurement. The Zn-Mg-Fe-O films were indicated a ferromagnetic phase at the room temperature.