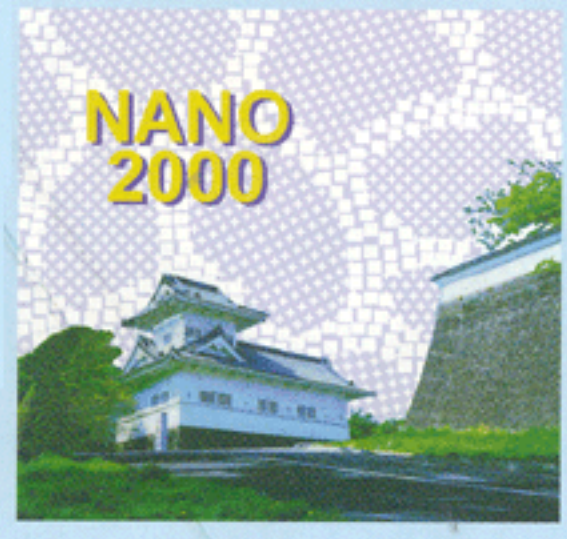

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Abstracts

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MAGNETIC PROPERTIES OF CO-BI FERRITE POWDERS AND THIN FILMS BY A SOL-GEL METHOD

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Ultrafine $CoFe_{1.9}Bi_{0.1}O_4$ powders and thin filems are fabricated by a sol-gel method and their magnetic and structural properties are investigated with an x-ray diffractometer (XRD), a vibrating sample magnetometer (VSM), and Mössbauer spectrometer. Co-Bi ferrite powders which were fired at and above 923 K have only a single-phase spinel structure and behave ferrimagnetically. Powders annealed at 523 - 823 K have a typical spinel structure and are simultaneously paramagnetic and ferrimagnetic in nature. The magnetic behavior of Co-Bi ferrite powders fired at and above 923 K shows that an increase of the annealing temperature yields a decrease of the coercivity and an increase of the saturation magnetization. The maximum coercivity and the saturation magnetization of Co-Bi ferrite powders are H_C = 1,368 Oe and M_S = 75 emu/g, respectively. ^{57}Fe Mössbauer spectra of Co-Bi ferrite have been taken at various temperatures from 13 to 875 K. The isomer shifts indicatesd that the valence states of the Fe ions have a ferric character. Co-Bi ferrite thin films annealed at 723 - 1123 K had a single phase spinel strcture without any preferred crystalline orientation.

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LARGE LOW-FIELD MAGNETORESISTANCE IN ZINC FERRITE/INSULATOR NANOGRANULAR SYSTEMS

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Large low-field magnetoresistance in $(Zn_{0.5+y}Fe_{2.5-y}O_4)_{1-x}/(Fe_2O_3)_x$ nanogranular systems has been observed in a wide temperature range while the single-phase samples of $Zn_{0.5+y}Fe_{2.5-y}O_4$ shows smaller magnetoresistance (1%-2%). The system (Fe_2O_3 nanoparticle with size 20nm) exhibits a giant magnetoresistance (23%) in magnetic field 5kOe at room temperature. The GMR effect of the samples is attributed to the spin-polarized tunneling in Fe_2O_3 nanoparticle located at boundary of $Zn_{0.5+y}Fe_{2.5-y}O_4$ grains.