B-9

Magnetic properties and microstructures of CoN electrode for MTJ

Ki Woong Kim*, Ja Hyun Koo, Seok Jong Woo, Il Jae Shil, and Jin Pyo Hong
New Functional Materials and Devices Lab, Department of Physics, Hanyang University, Seoul 133-791, Korea

Co-N films were fabricated on thermally oxidized Si substrates in an Ar and N_2 mixture by using a DC magnetron sputtering. The properties of Co-N thin films incorporating partial pressure of nitrogen gas are reported as new ferromagnetic electrode. These films was simply controlled to be either amorphous or nanocrystallin, depending on the nitrogen partial pressure, thickness, and thermal treatment. The experimental parameters were the nitrogen partial pressure, DC Power and film thickness. The structural properties of samples were determined by the X-ray diffraction and high resolution transmission microscopy, and the magnetization was measured by a vibrating sample magnetometer at room temperature. The TMR devices incorporated with amorphous or nanocrystallin CoN electrode was discussed in this letter, providing the necessary ingredients for the industrial development of various spintronic devices, such as high performance magnetic random access memory.