

## Effect of Ar Pressure on the Magnetic Properties of Fe-Si<sub>3</sub>N<sub>x</sub> Thin Films Prepared by co-Sputtering

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The magnetic properties of Fe-Si<sub>3</sub>N<sub>x</sub> thin films fabricated by a co-sputtering technique were studied by electrical resistivity, magnetometry, and Mössbauer spectroscopy as a function of the Ar pressure. As the Ar pressure increased, the electrical resistivity increased while the saturation magnetization decreased. The temperature and the field dependences of the magnetization of the co-sputtered thin films can be explained by a mixture of ferromagnetic and paramagnetic components. Also, the Mössbauer spectra showed good agreement with the magnetization results; the ferromagnetic contribution to the magnetization decreased with increasing Ar pressure.