Thermal effects on structural and magnetic properties of $Fe_{78}B_{13}Si_9$ amorphous ribbon

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The Differential Scanning Calorimetry (DSC), Resistivity (ρ) and Absolute thermoelectric Power (ATP) measurements are carried out to study the thermal effect on structural and magnetic evolution of soft magnetic $Fe_{78}B_{13}Si_9$ amorphous ribbons. In DSC of as-quenched sample, two clearly separated exothermic peaks are observed at 807 K and 820 K with $5\frac{K}{min}$. The kinetics of the crystallization give the values of the apparent activation energy Ea_1= 384$\frac{kJ}{mole}$ and Ea_2=308$\frac{kJ}{mole}$ and agrees with a kinetic evaluation of the peak temperatures according to Kissinger and Auguis-Bennet's models.Resistivity and ATP are very accurate probes of the state of matter, the informations are the same than those obtained by DSC at the same heating rates. Some characteristic values from hysteresis loops for maximum applied magnetic field H_max=1 kOe give magnetization M_s=116.89 $\frac{emu}{g}$ and hysteresis loops up to 27000 $\frac{A}{m}$ (about 300 Oe) give the coercive field Hc= 22 $\frac{A}{m}$.