THE STRUCTURE AND MAGNETIC PROPERTIES OF Fe-Si POWDER PREPARED BY BALL MILLING

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9.7 cm

We have prepared microcrystalline FeSi (6.5wt. % of Si) ribbon by melt spinning method and then milled in vibratory micro-mill up to 800 hours. The structure was detected by SEM and X-ray diffraction. Magnetic moment and coercivity were measured by vibrating sample magnetometer (VSM). Thermomagnetic curves were taken also by VSM. The room temperature Mssbauer transmission spectra were obtained using a conventional spectrometer with ^{57}Co/Rh γ-source. XRD spectra show the presence of two phases. The first phase is iron rich phase and second one is silicon-rich phase. Both phases were detected by measuring of thermomagnetic curves. The coercivity of milled powder at the beginning of milling process steeply increases and riches its maximium at 7.5 kA/m for 500 hours of milling. Than it decreases with milling time very slowly. We suppose that the maximum of the coercivity corresponds to the coercivity of single domain particles of iron rich Fe-Si phase.

13.4 cm

Subject category :

3. Transition Metals, Alloys and Compounds

Presentation mode :
poster

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