STUDY OF FORMATION OF THERMALLY STABLE SYSTEM FeSn/α-Fe(Sn)

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In the present paper thermally induced processes of phase formation in two-layer systems Sn(4 μm)–Fe(10 μm) have been studied by methods of Mössbauer spectroscopy on ^{119}Sn and ^{57}Fe nuclei.

A fragment of initial brick of technical iron has been cut into 1mm-thick plates. Then the plates were rolled down to ~10 μm with intermediate 3 h homogenizing annealing at 850°C. Tin layers were deposited on Iron foils by magnetron sputtering. Prepared samples were subjected to isothermal annealing in vacuum (5×10^{-6} mm Hg) at 550°C temperature. The duration of annealing was up to 20 h. ^{119}Sn and ^{57}Fe Mössbauer transmission measurements at room temperature have been carried out. Fitting of experimental spectra were spent by methods of model decoding of spectra (for ^{119}Sn) and restitution of distribution functions of hyperfine parameters of partial spectra. Result of fitting is shown in Fig

As a result of spent examinations:

1. The formation of FeSn intermetallide and α-Fe(Sn) solid solution was determined.
2. It was shown that the nature of phase transformations is defined by change of Tin local

concentration in sample in the diffusing of components and is corresponded to peculiarities of phase diagram Fe-Sn.

3. Thermally stable spatially inhomogeneous system FeSn/α-Fe(Sn) was obtained.

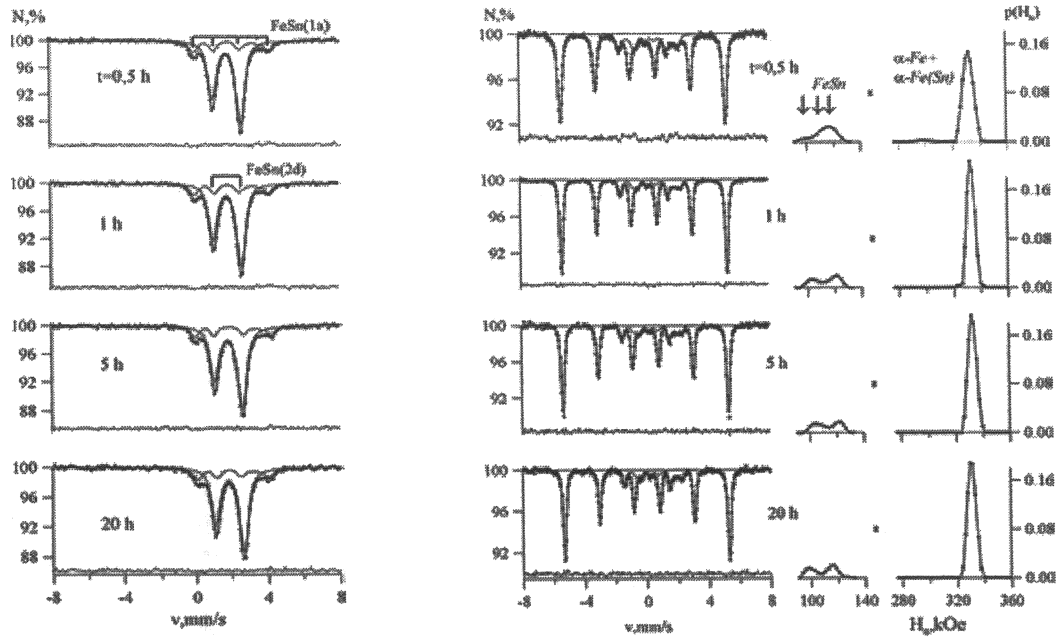

Figure. Mossbauer spectra of ^{119}Sn (a) and ^{57}Fe (b) nuclei and restored functions (c) of distribution of hyperfine field $p(H_n)$ for Fe-Sn lamellar system after annealing.