Properties of $Fe_{73.5-x}Si_{13.5}B_9Cu_1Nb_3Mn_x$ alloys measured by Mössbauer spectroscopy

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Amorphous alloys of $Fe_{73.5-x}Si_{13.5}B_9Cu_1Nb_3Mn_x$ (x = 1, 3÷15) were analysed by means of Mössbauer spectroscopy (MS) as quenched at room temperature T_0. At T_0 MS shows magnetic ordering for small values of *x*, weakening for larger values of x. The average hyperfine field $< H_{hf} >$ and centre shift $< CS >$ as a function of x were found to decrease with increasing x.

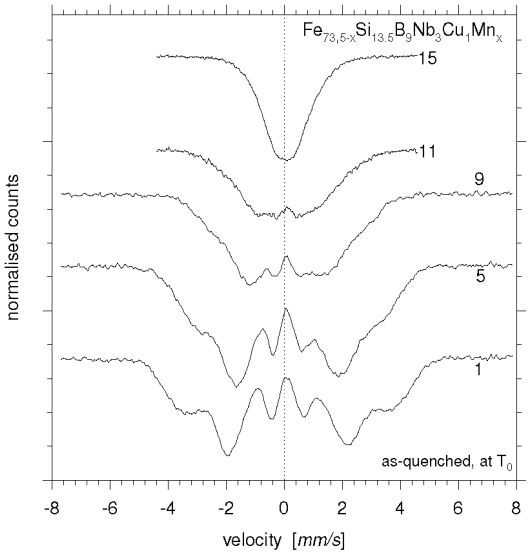

Fig. 1. Mössbauer spectra of $Fe_{73.5-x}Si_{13.5}B_9Cu_1Nb_3Mn_x$ measured at T_0 for different values of x.

The amorphous structure of the alloys at T_0 was demonstrated by absence of any XRD line. The Mössbauer spectra are typical for the amorphous structure, with broad line widths caused by hyperfine parameters distribution related to many in-equivalent iron sites. The selected set of the spectra measured at T_0 is shown in Fig. 1 for the given x. It can be noted that the spectra became less and less ferromagnetic as x increases. The spectra were analysed by fitting sextets with distribution of hyperfine field H_{hf} and the quadruple splitting ε.

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