

Structure and magnetic properties of amorphous $\text{Fe}_{74}\text{Hf}_4\text{Ta}_1\text{Cu}_1\text{Gd}_1\text{La}_x\text{Si}_{15-x}\text{B}_4$ ($x = 0, 7$) ribbons

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The multicomponent $\text{Fe}_{74}\text{Hf}_4\text{Ta}_1\text{Cu}_1\text{Gd}_1\text{La}_x\text{Si}_{15-x}\text{B}_4$ ($x = 0, 7$) alloys are promising candidates in the search for materials with unusual mechanical and magnetic properties. Amorphous nature of melt-spun samples was confirmed by XRD diffractometry and Mössbauer spectroscopy. The XRD patterns revealed a distinct amorphous halo. The low-field components of magnetic hyperfine field distributions on iron nuclei are observed in the Mössbauer spectra, with average hyperfine field values of 19.9 and 15.7 T for $x = 0$ and $x = 7$, respectively. Coercivity studied by vibrating sample magnetometer was 518 A/m for $x = 0$ and 135 A/m for $x = 7$ at 300 K and 596 A/m for $x = 0$ and 1197 A/m for $x = 7$ at 400 K. Remanence also changed with temperature, amounting to 0.70 T for $x = 0$ and 0.45 T for $x = 7$ at 300 K, while at 400 K it was 0.57 and 0.21 T for $x = 0$ and $x = 7$, respectively. It is shown that La addition has beneficial effect of shifting the Curie point towards lower temperatures together with the increase of magnitude of magnetization.