

Magnetoplastic effect in Cu-Be alloys

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Data about magnetoplastic effect (MPE) in metal alloys which arises in alloys after ageing in magnetic fields, are rather limited and controversial. At the same time MPE in metal alloys represents great interest from the point of view of atom-spin micromechanics and practical application in modern manufacture technologies of nanomaterials with guided properties.

For an establishment of mechanisms MPE model Cu-Be-alloys with various contents of Be, Ni and the maintenance of other magnetic impurity less, than 0,05 wt. % have been prepared and experimentally investigated [1]: 1) beryllium bronze BrB-2 (technical alloy); 2) binary alloys Cu-Be (high purity materials, maintenance Be from 0.5, 1.0, 1.6, 2.7 up to 3.0 wt. %) and 3) triple alloys Cu-2 wt. % Be with additives from 0.4 and 1.0 wt. % Ni. In the given work the possible micromechanisms of MPE in metal alloys of Cu-Be type with additives of nickel are discussed. Here MPE acts as the tool of studying of type and properties of obstacles (impurity atoms, spin clusters, nanophase evolution of intermetallic compounds, impurity segregation in interfaces with atomic and magnetic ordering) for moving dislocations. Discussion is spent in view of a new data about grain boundary impurity segregation, thin microstructure, magnetic properties and phase conditions of alloys, aged in magnetic fields.

[1] J.V. Osinskaya, A.V. Pokoev. Magneto-plastic Effect in Cu-Be Alloys with Ni Additives. Defect Diffusion Forum 363 (2015) 186.