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Magnetic and mechanical properties of deformable hard magnetic alloys on the Fe-Cr-Co system with 7%－8% cobalt

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With the purpose of the further increase of an economic efficiency hard magnetic alloys on the basis of system Fe-Cr-Co the study of magnetic and mechanical properties of alloys of this system in wt.% (26－30)Cr, (7－10)Co doped Ti, Si, V and Mo is carried out. The alloys smelted in the open induction furnace from charge components of industrial purity. Thermal processing of researched alloys carried out both in laboratory installation and on the commercial plant with pusher furnace solenoidal of a type. Optimization of modes of thermal processing carried out by methods one-way and multiple-factor of planning. On alloys from 8%(mass fraction) cobalt after optimum heat treatment (cooling in magnetic field in a temperature interval 640－620℃ with rate 0.1℃/min and further cooling up to 500℃ with the same rate but without a magnetic field) are received magnetic properties: residual induction Br=1.28－1.3 T, coercive force H_{cb}= 42－44 kA/m and maximum energy product $(BH)_{max}$=37－40 kJ/m^3. The investigated alloys from 7%－8%(mass fraction) cobalt are single-phase in all a temperature interval down to melting temperature also have in high-coercivity state breaking point σ_b=850 MPa at practically zero residual plasticity.

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