

Investigation of the processes of formation of the crystalline phase in layered amorphous-crystalline ribbons produced of Ti50Ni25Cu25 alloy during electric pulse treatment

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The effect of electric pulse treatment (EPT) on the microstructure of rapid-quenched layered amorphous-crystalline ribbons obtained by spinning a Ti50Ni25Cu25 melt on a rapid rotating copper disk has been experimentally investigated. A sequential series of samples of Ti50Ni25Cu25 alloy ribbons was obtained after EPT by a single pulse of electric current with a duration of 1 ms with an increase in the degree of heating before and after reaching the recrystallization temperature of the amorphous part of the ribbons. This treatment makes it possible to heat up the ribbon samples in a short time and carry out crystallization without isothermal exposure. As a result of the EPT, a sequential series of experimental samples of ribbons with various degrees of processing was obtained: from the state "without changing the structure" to the state "completely crystallized". The microstructure of the obtained samples was studied and the stages of EPT were determined. It is shown that the EPT method in layered amorphous-crystalline tapes can change the ratio of amorphous and crystalline phases, form structures with different layers and modify the shape memory effects. This research was funded by the Russian Science Foundation (project № 24-22-00035).