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Abstract

To make clear the effect of the K-state on the magnetic properties and the residual electric resistance in Fe-Al alloys, measurements were made with the 19.53 at% Al-Fe alloy at liquid He temperature after isothermal annealing at 235°C for various durations. Slight changes in the magnetic properties were detected by an improved precise apparatus. At the beginning of the annealing, the saturation magnetization increased until it reached the maximum after about 10 min of annealing, and then decreased. After a prolonged annealing, the magnetization and the hysteresis curves became constricted shape of perminvar type. The residual electric resistance at first decreased to the minimum after about 10 min of annealing and then increased, corresponding to the behaviour of the saturation magnetization. All these phenomena can be explained in terms of the existence of FeAl- or Fe_3Al-clusters in the disordered matrix.

* The **1370th** report of the Research Institute for Iron, Steel and Other Metals. Published in the Japanese Journal of Applied Physics, **7** (1968), 386.