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Dislocation Motion in Antiferromagnetic $\gamma$-Fe–Mn Alloys*

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Abstract

The plastic deformation of $\gamma$-Fe-Mn alloys has been investigated by tensile and stress relaxation tests and transmission electron microscopy. The flow stress increases below the Néel temperature and reaches about 1 kp/mm² at room temperature, but the activation volume and dislocation configuration do not change. This may be understood by the magnetic friction for dislocation motion in antiferromagnetic $\gamma$-Fe-Mn alloys, which is associated with the newly-produced ferromagnetic coupling at the nearest neighbour site rather than a change of the deformation process.

* The 1624th report of the Research Institute for Iron, Steel and Other Metals. Published in the Physica Status Solidi (a), 17 (1973), 677.