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Mechanical Behaviour of Crystals with Twinned Structure*

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Abstract

The internal friction and the stress-strain behaviour are investigated on three kinds of materials which contain many twinned regions. A relaxation peak of internal friction with the activation energy \((0.63 \pm 0.03)\) eV is observed in an 89 at\% manganese-copper alloy. The peak is thought to be associated with the elementary process in the motion of surface dislocations (twin boundaries). Plastic flow possibly due to the motion of twinning surface dislocations is observed at relatively low stress level in this alloy. The relaxation peak is not found in gold-46.1 at\% cadmium and indium-21 at\% thallium alloys. Characteristics in a pseudo-elastic flow due to the motion of twinning surface dislocations are examined on the gold-cadmium alloys.