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Kinematics of Dislocations in NaCl Crystals with Different Impurities

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Abstract. Kinematics of the magnetoplastic effect on the example of NaCl crystals is experimentally and theoretically studied. Specific features of dislocation motion under magnetic field with or without additional mechanical load in crystals doped with different types of impurities are considered. It is found that even small addition of Ni impurities to the NaCl(Ca) crystal leads to paradoxically strong increase of dislocation mobility. On the other hand, the NaCl(Ca+Pb) crystal, instead of plasticizing under the magnetic field, demonstrates rather strong strengthening. The atomic scale mechanisms of the phenomenon are discussed in detail on the basis of the results of macroscopic experiments.

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