ON THE TEMPERATURE DEPENDENCE OF PHOTOCONDUCTIVITY IN CADMIUM IODIDE LAYERED CRYSTALS

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S u m m a r y

The temperature dependence of photoconductivity in pure and PbI_2-doped cadmium iodide crystals in the temperature range 4.2–80 K is investigated. As the temperature decreased from 70 to 40 K, a growth of the photocurrent by more than four orders of magnitude was discovered; in the region $T < 40$ K, the magnitude of the photocurrent didn't depend practically on the temperature down to 4.2 K. The results are explained by the rise of the mobility of charge carriers in the case of their scattering by membrane vibrations of the CdI_2 layered lattice, variations of elastic constants, and the phenomenon of spontaneous deformation of the crystal in this temperature region. In the CdI_2–PbI_2 crystal system, the photocurrent at $T < 70$ K increases by at most two orders of magnitude; moreover, the behavior of its temperature dependence also changes. The influence of the impurity on bending vibrations of the host lattice is discussed.