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AUTHORS: Prepelitsa, B. V., Pokatilov, Ye. P.

TITLE: Electric conductivity and Hall effect in semiconductors with loops of extrema

SOURCE: Kishinev. Universitet. Uchenyye zapiski. v. 49, 1961, 29 - 31

TEXT: The occurrence of bands with extremum loops in wurtzite-type crystals when spin-orbital interaction is taken into account has been shown in group-theoretical studies by E. I. Rashba and V. I. Sheka (FTT, 1, 2, 162, 1959; FTT, 1, 3, 307, 1959). The energy of this interaction can reach several hundreds of eV, as was shown experimentally for CdS, and should exert a great effect on the kinetic coefficients. This effect was theoretically determined as regards the relaxation time, the electric conductivity, and the Hall effect. The expressions for $1/\tau$, σ_H/σ_L , and the Hall coefficient ratio $R(H\parallel z)/R(H\perp z)$ obtained in crystals with circular minimum loops are compared with those for point minima. It is shown that measurements of the Hall constant offer the best way of finding out whether a semiconductor has an extremum loop or not; the
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Electric conductivity and Hall effect ...

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mobilities or the conductivity ratios differ only by a factor of 2. The Hall coefficient ratio for semiconductors with extremum loops is characterized by an exponential drop with temperature.