

POLARON-TYPE STATES IN ONE-DIMENSIONAL SEMICONDUCTORS

A. A. Eremko

Bogolyubov Institute for Theoretical Physics,
Nat. Acad. Sci. of Ukraine
(14b, Metrolohichna Str., Kyiv 03143, Ukraine;
e-mail: eremko@bitp.kiev.ua)

S u m m a r y

The states of electrons and holes which interact with lattice vibrations in a one-dimensional semiconductor are considered. Moderately strong electron-phonon coupling leads to the self-trapping of carriers and polaron and bipolaron states for electrons or holes, as well as bound localized states of electron-hole pairs are formed. The self-trapping of carriers is accompanied by self-consistent lattice distortion which causes the appearance of bound electronic levels in the forbidden energy band, and, therefore, leads to the appearance of specific spectral lines within the gap region in the optical absorption spectra.