The European Physical Journal B - Condensed Matter and Complex Systems
February 1999, Volume 7, Issue 4, pp 563-572

An attempt to model the dielectric function in II-VI ternary compounds and

Abstract:

The dielectric function of II-VI ternaries is described by fitting experimental results at room temperature to three different models. For each individual composition, variations with photon energy **E** are well reproduced with only four harmonic oscillators. The model dielectric function (MDF) of Adachi which is linked to the band structure does not give better results in the description of and its derivatives are not correctly reproduced. The MDF model of Kim *et al.* lead to good descriptions both of and its derivatives in all the spectral range considered, and it appears the most powerful model at the present time. We have not fully succeeded in building a composition dependent model for these bulk semiconductors. The analysis of this failure reveals that, though the materials appear good, their unknown densities of defects appear uncorrelated with the composition of the ternaries. These non controlled defect densities lead mainly to erratic deviations of the broadenings near critical transitions. Though relatively small these erratic deviations on the broadenings prevent the set up of a precise composition dependent model. variations are also calculated below the fundamental gap in HgZnTe and CdZnTe. Zero frequency values are compared with known experimental results. The large variation of with composition **x** in prevents the revealing of the part of due to the defects. In return, the effect of the defects on the crystal polarizability is evidenced in where the variation of with **x** is small. This leads us to propose that the most probable values of are near 7.1 for CdTe and 6.75 for ZnTe.

Received: 22 May 1998 / Revised: 21 September 1998 / Accepted: 28 September 1998

About this Article

Title
An attempt to model the dielectric function in II-VI ternary compounds and
Journal
The European Physical Journal B - Condensed Matter and Complex Systems
Volume 7, Issue 4 , pp 563-572
Cover Date
1999-02-01
DOI
10.1007/s100510050649
Print ISSN
1434-6028
Online ISSN
1434-6036
Publisher
EDP Sciences, Springer-Verlag

Keywords

- PACS. 78.20.-e Optical properties of bulk materials and thin films - 71.22.+i Electronic structure of liquid metals and semiconductors and their alloys - 77.22.Ch Permittivity (dielectric function)

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