Pnictide and chalcogenide semiconductors

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1 Introduction

An excellent handbook-style review on chalcogenides can be found in [1]. Other useful and up-to-date resources on chalcogenides include collection of papers [2], general reviews [3, 4] and monographs [5, 6], specialized journal *Chalcogenide Letters* and Web-page [7]. Despite the long history of persistent studies, the entire picture of the physics of chalcogenides is far from completeness, consistency, and concordance. The reason of this is twofold. On the one side, chalcogenides exist in various forms from bulk and molecular crystals to glasses and amorphous films accepting various nonstoichometric compositions. Moreover, for a specific substance like g-As_2Se_3 observed phenomena are also sample dependent: often different authors obtain different results. At the same time many physical phenomena are common for all chalcogenides, so that one may think to find some "universal theory". But this way looks fallacious since for many phenomena their opposite counterpart is also observed, e.g. photocrystallization and photoamorphization processes, that leads sometimes to ridiculous situation when different authors use the same deduction line and come to opposite phenomena. Therefore from the view of the above facts experimental studies of chalcogenides should be done under precise knowledge of what substance is under investigation and a theoretical analysis of existing experiments should be done with taking into account all the