

## Positron Annihilation In Semiconductors Defect Studies Springer Series In Solidstate Sciences

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### Positron Annihilation In Semiconductors Defect

The electrical and optical properties of semiconductors are dominated by lattice defects. Positron annihilation has become one of the most important techniques for the investigation of vacancy-like defects. Positrons may be captured in lattice imperfections and the annihilation signal then contains specific information on the type and the concentration of these defects.

### Positron Annihilation in Semiconductors - Defect Studies ...

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### Positron Annihilation in Semiconductors: Defect Studies ...

This comprehensive book reports on recent investigations of lattice imperfections in semiconductors by means of positron annihilation. It reviews positron techniques, and describes the application of these techniques to various kinds of defects, such as vacancies, impurity vacancy complexes and dislocations.

### Positron Annihilation in Semiconductors: Defect Studies ...

A. Defects in semiconductors 2 1. Role and formation of defects in semiconductors 2 2. Studying defects in semiconductors 3 B. Positron annihilation spectroscopy 4 1. Background 4 2. Positron annihilation methods 5 II. Experimental 7 A. Positrons in solids 7 1. Implantation, thermalization and diffusion 7 2. Positron states and trapping 7 3 ...

### Defect identification in semiconductors: Experiment and ...

The subject of this book is the investigation of lattice imperfections in semiconductors by means of positron annihilation. A comprehensive review is given of the different positron techniques,...

### Positron Annihilation in Semiconductors: Defect Studies ...

Positron annihilation spectroscopy is particularly suitable for studying vacancy-type defects in semiconductors. Combining state-of-the-art experimental and theoretical methods allows for detailed...

### Defect identification in semiconductors with positron ...

EL2 in GaAs: important antisite Defect • before annihilation, diffusing positrons can be trapped by such defects • as a consequence: positron lifetime increases due to the reduced electron density in the vacancy • experiment shows the existence of a Ga vacancy in the metastable state of GaAs, which does not exist in stable ground state

### Positron Annihilation Spectroscopy on Defects in ...

Positron annihilation spectroscopy is also used for the study of crystallographic defects in metals and semiconductors; it is considered the only direct probe for vacancy-type defects.

### Electron-positron annihilation - Wikipedia

Abstract. The potential of positron annihilation spectroscopy (PAS) for defect characterization at the atomic scale in semiconductors has been demonstrated in thin multilayer structures of SiGe (50 nm) grown on UTB (ultra-thin body) SOI (silicon-on-insulator). A slow positron beam was used to probe the defect profile.

### Defect Characterization in SiGe/SOI Epitaxial ...

For solids containing free electrons (such as metals or semiconductors), the implanted positrons annihilate rapidly unless voids such as vacancy defects are present. If voids are available, positrons will reside in them and annihilate less rapidly than in the bulk of the material, on time scales up to ~1 ns.

### Positron annihilation spectroscopy - Wikipedia

Positron annihilation spectroscopy is particularly suitable for studying vacancy-type defects in semiconductors. Combining state-of-the-art experimental and theoretical methods allows for detailed identification of the defects and their chemical surroundings. Also charge states and defect levels in the band gap are accessible.

### Defect identification in semiconductors with positron ...

semiconductors. Positron annihilation from the delocalized states in the perfect lattice as well as from the localized states at vacancies and divacancies is considered.

### Positron annihilation in II-VI compound semiconductors: theory

Positron annihilation spectroscopy has been widely used for studying defects in semiconductors since the early 1980s, whilethefirstreportsdealingwithradiationdamageinsilicon and germanium had been published already in the 1970s (Cheng and Yeh, 1973; Arifov, Arutyunov, and Ilyasov, 1977). The early developments of both experimental and

### Defect identification in semiconductors with positron ...

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### Positron Annihilation in Semiconductors - GBV

This comprehensive book reports on recent investigations of lattice imperfections in semiconductors by means of positron annihilation. It reviews positron techniques, and describes the application of these techniques to various kinds of defects, such as vacancies, impurity vacancy complexes and dislocations.

### Positron annihilation in semiconductors : defect studies ...

Positron annihilation studies of atomic defects in elemental and compound semi- conductors have developed into a broad field of investigation during the last few years (for recent reviews on specific topics see Dlubek and Krause (1987), Dannefaer (1987)).

### Defects in semiconductors after electron irradiation or in ...

In general, positron annihilation spectroscopy gives microscopic information about vacancy defects in semiconductors in the concentration range of 10 15 -10 19 cm - 3. The positron lifetime is the fingerprint of the open volume associated with a defect, and it can be used to identify mono- and divacancies and larger vacancy clusters.

### Annihilation Radiation - an overview | ScienceDirect Topics

One of the best books for understanding the basics of Positron annihilation spectroscopy. The author has given a good analysis and review on the defect characterization of semiconductors. I strongly recommend this book for everyone working in PAS studies of semiconductors.