Defects in Semiconductors Studied by Positron Annihilation

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Positron research of semiconductor defects is now intensively done for more than three decades. The peculiarities of positron trapping in semiconductors appearing due to the Coulombic interaction of the positron with charged defects are in the meantime relatively well understood. Thus, Positron Annihilation Spectroscopy became a very useful standard tool for defect characterization in semiconductors [1].

In the talk, the technique will be explained including new developments (positron microscopy; intense positron sources for materials research). Prominent examples of semiconductor defect studies of the last 20 years will be presented. This will include elementary semiconductors as well as II-VI and III-V compound semiconductors in the as-grown state and after damaging (low-temperature electron irradiation, ion implantation, and plastic deformation) using all techniques of positron annihilation.

[1] R. Krause-Rehberg, H.S. Leipner "Positron Annihilation in Semiconductors", Vol. 127 of Series "Solid-State Sciences", Springer-Verlag, Berlin 1999