

Research using BARC positron beam facility

Positron annihilation spectroscopy (PAS) is an efficient nuclear-probe technique to study microstructural aspects in materials: for example, crystal defects in metals, alloys & semiconductors, molecular free-volumes in polymers and micro- & meso-pores in porous materials. In Radiochemistry Division, BARC variable energy slow positron dc beam facility has been developed and utilized since more than a decade to study depth profile of vacancy-like defects in multilayered system of metals & semi-conductors, and free-volumes in polymer thin films. Recently, a pulsed slow positron beam facility is developed in Radiochemistry Division for quantitative estimation of molecular free-volumes in polymers and other porous thin films. An intense positron beam facility using Dhruva research reactor has been proposed, where thermal neutrons and high energy gamma rays will be used for the production of intense positron flux. The intense positron beam facility will be used for research on defect evolution in nanosecond time scale via single-shot spectroscopy techniques and positronium molecular spectroscopy.

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