Radiation Technology and Applications of materials and environment using ion-beams, electron-beams and gamma-rays

T. Kamiya

Japan Atomic Energy Agency, Takasaki, Japan

Abstract: In Takasaki Advanced Radiation Research Institute of Japan Atomic Energy Agency (JAEA), R&D for bio-technology, for environment and for industrial materials have been progressed based on advanced facilities and radiation technologies using ion-beams, electron-beams and gamma-rays. In the development of materials among them, various new organic materials, such as fuel cell electrolyte polymer membranes, polymer-based metal adsorbents, and bio-degradable polymers have been created utilizing mechanism of cross-linking or grafting in polymer induced by radiation. Inorganic materials, such as hydrogen separation membrane and optical hydrogen sensor have been also made using ion beam techniques. R&D on removal/decomposition process of trace pollutants have been progressed using electron beams. Studies on evaluation of radiation tolerance of semiconductor and of insulating materials have been also performed using various radiations facilities. And the advanced radiation technologies, such as ion microbeams, in particular, using high-energy heavy ion beams from the AVF cyclotron, have been progressed for studies on cell irradiation effects and for verification of single-event effect of semiconductor.