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Structural and electrical transformations of Ag-implanted polyethylene terephthalate (PET) induced by swift heavy ion irradiation

The present study investigates the combined effects of ion implantation and swift heavy ion irradiation on the structural and electrical properties of polyethylene terephthalate (PET). Samples were first implanted with 150 keV Ag⁺-ions at fluences of 1 x 10^16, 5 x 10^16 and 1 x 10^17, then irradiated with 30 MeV Au⁷⁺ ions. Atomic force microscopy (AFM) images and optical micrographs reveal blistering induced by swift heavy ions, especially at the highest implantation dose. Raman studies show two bands, with the larger band indicating the presence of amorphous and graphite-like structures in the samples. The band intensities decrease depending on the processing conditions, signifying optical and structural transformations in the implanted and/or irradiated PET. Current-voltage (I-V) measurements indicate an increase in the conductivity of the implanted samples, which is further enhanced upon irradiation, highlighting a transition from insulating to semiconducting behavior.

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None

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Yes, I ACCEPT

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