



Contribution ID: 24

Type: Poster Presentation

## 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<sup>+</sup>-ions at fluences of  $1 \times 10^{16}$ ,  $5 \times 10^{16}$  and  $1 \times 10^{17}$ , then irradiated with 30 MeV Au<sup>7+</sup> 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.

### Apply for student award at which level:

None

### Consent on use of personal information: Abstract Submission

Yes, I ACCEPT

**Primary author:** Dr MBOUKAM, Jean Jules (Photovoltaic NanoComposites R&D Platform, Physics Department, Tshwane University of Technology, P Bag X680, Pretoria 0001, South Africa)

**Co-authors:** Mr CHILUKUSHA, Daniel C (Photovoltaic NanoComposites R&D Platform, Physics Department, Tshwane University of Technology, P Bag X680, Pretoria 0001, South Africa); Dr MADHUKU, Morgan (iThemba LABS, Tandem and Accelerator Mass Spectrometry Laboratory, P. Bag 11, Wits 2050, South Africa); Prof. MSI-MANGA, Mandla (1-Photovoltaic NanoComposites R&D Platform, Physics Department, Tshwane University of Technology, P Bag X680, Pretoria 0001, South Africa, 2-iThemba LABS, Tandem and Accelerator Mass Spectrometry Laboratory, P. Bag 11, Wits 2050, South Africa)

**Presenter:** Dr MBOUKAM, Jean Jules (Photovoltaic NanoComposites R&D Platform, Physics Department, Tshwane University of Technology, P Bag X680, Pretoria 0001, South Africa)

**Session Classification:** Poster Session

**Track Classification:** Track A - Physics of Condensed Matter and Materials