



Contribution ID: 134

Type: **Poster Presentation**

## Influence of argon-implantation on thermoluminescence of synthetic quartz

*Wednesday, 9 July 2014 17:10 (1h 50m)*

**Abstract content &nbsp; (Max 300 words)<br><a href="http://events.saip.org.za/getFile.py/a" target="\_blank">Formatting &<br>Special chars</a>**

Thermoluminescence of single crystalline synthetic quartz samples exposed to beta irradiation subsequent to implantation with 70 keV Ar ions at fluences ranging between  $1 \times 10^{14}$  and  $5 \times 10^{15}$  ions/cm<sup>2</sup> is reported in this study. The glow curves, recorded with a linear heating rate of 5 oC/s, show a prominent main peak at a temperature in the range 112-136 oC. However for the sample implanted at the highest fluence, a secondary peak emerges at about 400 oC. Furthermore it was found that all implanted samples enhance the thermoluminescence emission with respect to the unimplanted sample. This enhancement can be attributed to an increase in the concentration of defects which act as electron traps or recombination centres. Kinetic analysis of the thermoluminescence was carried out using a variety of methods including the whole curve, peak shape and glow curve deconvolution methods. Kinetic parameters, i.e., activation energy (E), frequency factor (s), and order of kinetics (b) were evaluated and found to be comparable through the different analytical methods used. This observation indicates that the change in implantation fluence does not necessarily affect the nature of the electron trapping centres.

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no

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PhD

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yes

**Primary author:** Dr NSENGIYUMVA, Schadrack (Rhodes University)

**Co-author:** Prof. CHITHAMBO, Makaiko (Rhodes University)

**Presenter:** Dr NSENGIYUMVA, Schadrack (Rhodes University)

**Session Classification:** Poster2

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