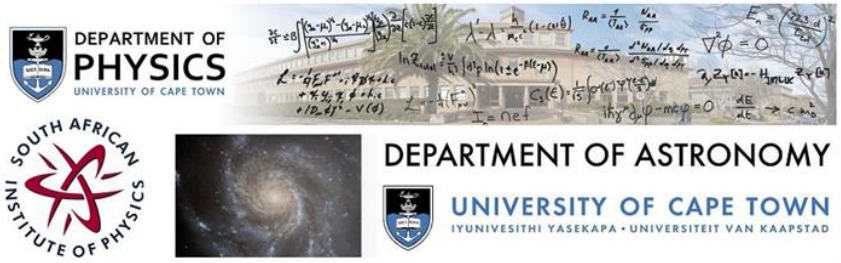

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Photo-thermal degradation analysis of single junction amorphous silcion solar module EVA encapsulation

Wednesday, 6 July 2016 16:10 (1h 50m)

Abstract content
   (Max 300 words)
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Ethylene vinyl acetate (EVA) encapsulation degradation affects the performance of photovoltaic (PV) module. Hot spot formation causes the EVA encapsulation to undergo photo-thermal deterioration, and molecular breakdown by ultra-violet (UV) radiation. This leads to diffusion of chemical particles from one layer to another. During outdoor deployment, the EVA encapsulation in the affected region losses its adhesive strength, when this happens the layer in the affected region undergoes rapid delamination. The presence of photo-thermal degradation is detrimental to the reliability of PV modules because it causes both optical and thermal degradation. Photo-thermal degradation makes the encapsulant in the affected region to be more susceptible to chemical substances and moisture. Scanning Probe Microscope (SPM), Energy Dispersive X-ray (EDX) and Thermogravimetric analysis were used to investigate the observed photo-thermal degradation. Why Fourier Transform Infrared Spectroscopy (FTIR) was used for the optical degradation. Our findings show high concentration of Sodium, Phosphorus and Aluminium, which originate from the glass substrate, cell emitter and back contact respectively.

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