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**Comparison of the mechanical and thermal properties of TiO<sub>2</sub> nanofiller and TiO<sub>2</sub> dispersed epoxy composites****Olusola Olaitan Ayeleru<sup>1</sup>, Freeman Ntuli<sup>1</sup>, Peter Apata Olubambi<sup>1</sup> and Williams Kehinde Kupolati<sup>2</sup>**

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The dispersion of nanofiller into the polymer matrix enhances the properties of polymers such as mechanical, thermal and electrical properties that are often lost when polymers are treated using incineration or landfilling. This paper aims to investigate the mechanical and thermal properties of polymer-based TiO<sub>2</sub> nanofiller and as-received TiO<sub>2</sub>. This was achieved by dispersing the synthesized TiO<sub>2</sub> nanofiller and the as-received TiO<sub>2</sub> in epoxy resin and Diamino Diphenyl Methane (DDM) (as hardener) separately in two different molds at a temperature of about 80°C for 1 hour and allowed to cure. The molds were made to cool and the solid nanocomposites obtained were taken for the mechanical and thermal properties analysis. The tensile strength, hardness, elastic modulus and scratch hardness tests were evaluated. The TGA and DSC characterization were also investigated to observe the thermal property and the thermal degradation behavior of the samples. Results obtained showed an improvement in both the thermal and mechanical properties of the recycled polymer-based nanofiller.

**Biography**

Olusola Olaitan Ayeleru has completed both Bachelor (BEng) and Masters (MTech) degrees in Chemical Engineering from the Federal University of Technology, Nigeria and the University of Johannesburg, South Africa. He is currently undertaking his PhD research in Chemical Engineering at the University of Johannesburg. His area of specialization includes municipal solid waste management, plastic waste management, process economics, energy consumption and economic analysis, smart materials, nanotechnology, self-healing technology, etc. He has presented papers both in international conferences and local conferences.

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