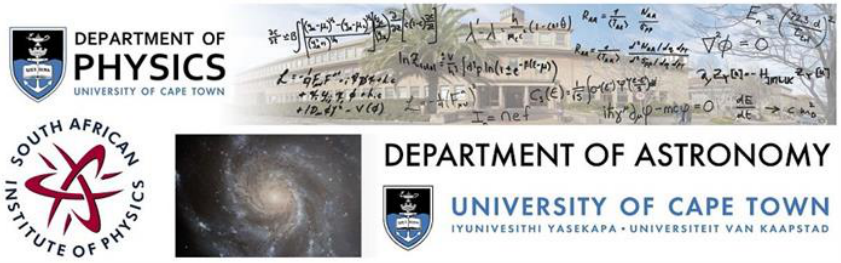

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Spark Plasma Sintering of 2507 duplex stainless steel

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Abstract content
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As technological development is advancing towards the use of powder metallurgical (P/M) processed stainless steels for automotive and structural applications, 2507 duplex stainless steel have gained considerable scientific attention and technological interest due to potential benefit associated with their unique properties such as corrosion and oxidation resistance and good formability. However, application of this material is hindered by its low mechanical strength and poor anti-friction properties resulting from the elongated porosity which acts as stress concentration sites that could lead to premature and brittle failure at a relatively lower load. These drawbacks can be improved using appropriate technology. Effort was made in this study to reinforce 2507 stainless steel with TiC particles and consolidate with spark plasma sintering (SPS). A relative density of 99.7% and Vickers hardness of 289.7 HV was obtained for 2507 DSS sintered at 1000 oC. The hardness value of 2507 stainless steel containing 10 vol%TiC was found to be 296.03 HV. The microstructure of the material produced was investigated using SEM.

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