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Light scattering studies of boron carbide films grown by laser ablation: thin-film surface quality and elasticity

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Covalently bonded solids based on boron, carbon, or nitrogen are the hardest materials, and B₄C is the third hardest after diamond and cubic boron nitride. Thin films of boron carbide were formed by pulsed laser deposition at room temperature and at higher temperatures up to 800 °C using a sintered B₄C target. Whilst the nature of the particulates embedded in the films and the composition and bonding states of the films is known to vary depending on the laser fluence, it is of considered interest in this study to understand how the surface quality, microstructure and tensile properties of B₄C would depend on substrate temperature. The deposition parameters such as the laser intensity, vacuum, supporting gas conditions, target-substrate distance, would be controlled such that only substrate temperature is used to modify the film properties and composition. Raman scattering studies and AFM measurements would be used to probe the microstructure and bonding of the film as the substrate temperature is varied, whilst Brillouin scattering measurements would be used to examine the elasticity changes.

Level (Hons, MSc, PhD, other)?

other

Consider for a student award (Yes / No)?

no

Would you like to submit a short paper for the Conference Proceedings (Yes / No)?

yes

Primary author: Dr MATHE, Bhekumusa (University of the Witwatersrand)

Co-authors: Prof. COMINS, Darrel (University of the Witwatersrand); Prof. SCHONING, Frederich (University of the Witwatersrand)

Presenter: Dr MATHE, Bhekumusa (University of the Witwatersrand)

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