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Contribution ID: 410

Type: Oral Presentation

Induced Stress studies of RF Magnetron Sputtered ZrC thin films

Friday, 13 July 2012 08:20 (20 minutes)

Abstract content
 (Max 300 words)

Thin hard films of transitional metal carbides have found widespread application as protective coatings due to their chemical inertness under extreme environments. In this work ZrC thin films on etched (100) Si substrates have been grown by RF sputtering at 0 and - 60V bias to observe stress relaxation using surface Brillouin scattering. RF powers between 100W - 200W and Ar₂ working gas pressure of 1.0 x10⁻³mbar have been used to yield a deposition rate of 0.16nm/s. Surface Brillouin studies on the - 60V biased and the unbiased samples have shown the higher order resonance modes. These Sezawa modes indicate high film quality and low surface roughness. The dispersion curves have shown an increase in sound velocity corresponding to an increase in elastic constants upon biasing. The elastic constants will be extracted from the dispersion curves.

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Session Classification: Applied Physics Forum

Track Classification: Track F - Applied Physics