

Studies on zirconia thin films deposited by pulsed laser ablation

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Abstract

Due to its high strength, biocompatibility and stability at high temperatures zirconium oxide (or zirconia) is useful for applications involving gas sensors, high refractive index optical coatings, corrosion or heat resistant coatings for mechanical parts, and biomedical bone implants.

ZrO₂ thin films were prepared by ablation of a ceramic (zirconia) or a metallic (zirconium) targets in oxygen reactive atmosphere on titanium substrates. By adding a radio-frequency generator to the pulsed laser deposition system, zirconia thin films were also grown. The influence of the deposition parameters, such as substrate surface and radio-frequency power and oxygen pressure, on the morphology and optical properties of the deposited layers has been investigated. Atomic force microscopy and spectral-ellipsometry have been used to characterize the deposited layers.

Keywords: Zirconia, thin films, PLD/RF-PLD

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