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INFLUENCE OF MAGNETRON SPUTTERING CONDITIONS ON THE CHEMICAL BONDING, STRUCTURAL, MORPHOLOGICAL AND OPTICAL BEHAVIOR OF $Ta_{1-x}O_x$ COATINGS

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ABSTRACT

In this work $Ta_{1-x}O_x$ coatings were deposited by DC magnetron sputtering in an $Ar+O_2$ atmosphere. The influence of the oxygen partial pressure on the morphology (SEM), structure (XRD), chemical bonding (XPS), thermal oxidation and optical response (FTIR and spectroscopic ellipsometry) of Ta-based films was study.

Cross-section morphology revealed that the increase of oxygen content in the coatings change the columnar morphology to featureless. Likewise, structural results showed that the small increase of oxygen amount leads to a change from Ta stable phase (α-Ta: bcc) to a mixture of phases achieving oxide phases with large amounts of oxygen. Whereas at room temperature the oxide coatings mainly revealed an amorphous character, at 700°C

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