Contribution ID: **389** Type: **Poster**

Study of the effect of Nitrogen flow on the structure, chemical composition and plasma generated in the synthesis of TiAlTaNbZrN coatings using the HiPIMS system

The aim of research is to evaluate how the nitrogen flow in a HiPIMS system affected plasma and microstructural characterization during the deposition of TiAlTaNbZrN. First, the synthesis conditions for producing the TiAlTaNbZr metallic coatings were optimized by varying the pressure and substrate bias in orden to identify the best conditions in terms of FCC structure (using X-Ray Diffraction (XRD)) and adhesion (using Scratch Test). Subsequently, TiAlTaNbZrN coatings were deposited varying nitrogen flows, and simultaneously the plasma parameters were studied using Optical Emission Spectroscopy (OES). Lastly, the results of plasma characterization were correlated with the microstructure and chemical composition of the films deposited, using XRD for determining crystalline structure and Energy Dispersive Spectroscopy (EDS) for determining the elemental concentration.

Keywords

Sputtering, HiPIMS, TiAlTaNbZrN, Optical, Plasma

Reference

L. Wang, J. Jin, C. Zhu, G. Li, X. Kuang, y K. Huang, "Effects of HiPIMS pulse-length on plasma discharge and on the properties of WC-DLC coatings", Appl Surf Sci, vol. 487, pp. 526–538, sep. 2019, doi: 10.1016/J.APSUSC.2019.05.046.

This work was supported by

Universidad Nacional de Colombia

Author approval

I confirm

Author will attend

I confirm

Author: MENDOZA CASTAÑEDA, Sara (Departamento Mecánica y Mecatrónica, Universidad Nacional de Colombia)

Co-authors: Ms GONZÁLEZ ÁVILA, Ingrid Johana (Universidad Nacional de Colombia); Dr OLAYA FLOREZ, Jhon Jairo (Universidad Nacional de Colombia); Mr GONZÁLEZ LOZANO, Juan Pablo (Universidad Nacional de Colombia); Dr PIAMBA TULCÁN, Óscar Edwin (Universidad Nacional de Colombia)

Presenter: MENDOZA CASTAÑEDA, Sara (Departamento Mecánica y Mecatrónica, Universidad Nacional de Colombia)

Session Classification: PLASMA AND VACUUM

Track Classification: Plasma and Vacuum