

ITFPC¹⁵

INNOVATIONS IN THIN FILM
PROCESSING AND CHARACTERIZATION



www.vide.org/itfpc15

ABSTRACT BOOKLET

November 16-20, 2015
Nancy (France)



Jointly organized by
French Vacuum Society (SFV)
and Institut Jean Lamour (IJL)



Endorsed by



P2.12-031 - COMPARISON OF WB_{2.5} THIN FILMS DEPOSITED BY PULSED LASER DEPOSITION AND MAGNETRON SPUTTERING.**J. Hoffman, J. Chrzanowska, T. Mościcki***Institute of Fundamental Technological Research, Pawińskiego 5 B, 02-106 Warszawa (PL)*

WB_{2.5} is a material with good corrosion resistance and high hardness ^[1,2]. The properties of WB_{2.5} thin films deposited on Si substrate by pulsed laser deposition (PLD) and magnetron sputtering were investigated. The target used during experiments was fabricated from boron and tungsten powders, mixed in the molar ratio 2.5:1 and sintered by spark plasma sintering according to parameters presented in [1]. In PLD process Nd:YAG laser (wavelength 1064 or 355 nm, pulse duration 10 ns, fluence 2 or 4 J/cm², repetition rate 10 Hz) was used. During magnetron sputtering power density was 2.8W/cm². In both experiments the substrate was deposited at room temperature and at 540°C. The thickness of WB_{2.5} layers was about 1µm. Layers were characterized by Scanning Electron Microscope, X-Ray Diffraction and nanoindentation test. Surface morphology, crystalline structure and chemical composition depend on method of deposition.

Acknowledgment

This work was supported by the NCN (National Science Centre) Research Project: UMO-2012/05/D/ST8/03052

References:

- [1] J. V. Rau, A. Latini, R. Teghil, A. De Bonis, M. Fosca, R. Caminiti, V. R. Albertini, Superhard Tungsten Tetraboride Films Prepared by Pulsed Laser Deposition Method, *Appl. Mater. Interfaces* 3 (2011) 3738-3743
- [2] R. Mohammadi, A. T. Lech, M. Xie, B. E. Weaver, M. T. Yeung, S. H. Tolbert, B. Kaner, Tungsten tetraboride, an inexpensive superhard material 108 (27) (2011) 10958-10962
- [3] T. Mościcki, J. Radziejewska, J. Hoffman, J. Chrzanowska, N. Levitantant-Zayonts, D. Garbiec, Z. Szymański, WB₂ to WB₃ phase change during reactive spark plasma sintering and pulsed laser ablation/deposition process, *Cer. Intern.* 41 (7) (2015) 8273-8281