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Experimental study of DC driven hybrid PVD-PECVD processTereza Schmidtová¹, Pavel Souček¹, Petr Vašina¹¹Masaryk university, Brno, Czech Republic

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Hybrid PVD-PECVD process of titanium sputtering in argon and acetylene has been used for deposition of nanocomposite material consisting of nanocrystallites of titanium carbide embedded in hydrogenated carbon matrix. nc-TiC/a-C:H layers showed promising combination of properties such as high hardness and Young's modulus with low friction and wear making it an industrially attractive material for protective coatings. Hybrid PVD-PECVD process combines aspects of both conventional techniques: sputtering of titanium target (PVD) and acetylene as a source of carbon for polymerization (PECVD).

Evolution of basic deposition plasma parameters such as discharge voltage and current, total pressure and selected spectral emission line intensities as a function of acetylene supply flow is reported and correlated with the evolution of the state of the target. The aim of this contribution is to understand the influence of RF substrate bias and magnetic field configuration on deposition process. It can be expected that the additional RF plasma interacts with DC plasma near the target. Also, the magnetic field configuration (well balanced x strongly unbalanced) effects the acetylene dissociation, target poisoning and the extent of the interaction of the two plasmas (DC and RF).

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Keywords

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diagnostics