STUDY OF SURFACE MODIFICATION ON BIOCOMPATIBLE Ag-TiCN COATINGS AFTER CELL CULTURE

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In previous works we have assessed the feasibility of Ag-TiCN coatings to be used as protective thin films for biomedical implants. Samples were prepared by DC unbalanced reactive magnetron sputtering with contents of Ag ranging from 0 to 20 at.% and Ti from 35 to 15 at.% while keeping C, N and O content constant. The coatings were fully characterized in terms of composition (GDOES, RBS), structure (XRD, SEM), and biological properties (cytotoxicity and biofilm formation) and tribo-mechanical behaviour under biological conditions. In this work we will summarised those results. In particular, we have selected three samples with different Ag contents (0, 6 and 20%) and carried out their characterization using XPS, ARXPS and HR-SEM to study in more detail the surface modification of the coatings. Moreover, compositional depth profiling of the coatings have been obtained by RBS measurements using 3.70 MeV He⁺ ions in order to make use of the nitrogen resonance with helium at that energy. Samples were in previous contact with the media used to perform biofilm formation (Tryptic Soy Broth) and cytotoxicity (Dubblecco’s Modified Medium) assays in order to represent the environment which occurs during those studies. Results have been compared to the ones obtained for the as deposited samples and after an autoclave sterilization process.

Keywords
biomedical coatings
Ag-TiCN
XPS
RBS
surface modification