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# Drug release In Ti-15Mo alloy after plasma deposition associated biomimetic surface treatment

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## Abstract

In the last years, several researches about materials to replace hard tissue in the human body have been realized. However, the study of surface properties of these materials are overcoming the well-known field of bulk properties.

The purpose of this study was to evaluate the influence of plasma depositions in drug delivery on the surface of titanium alloys after biomimetic surface treatment.

Ti-15 Mo alloy was obtained from C.P. titanium and molybdenum by using an arc-melting furnace. Ingots were submitted to heat treatment and they were cold worked by swaging. Discs with 10 mm in diameter and 3 mm in thickness were cutting. For surface treatment, samples were immersed in NaOH aqueous solution and they were heat treated at 300 °C for one hour in an electrical furnace. Discs were soaking in SBF5X to form an apatite layer on the surface and antibiotic was incorporated. After this, plasma deposition was realized. The monomer used for the establishment of the coating was allylamine, which was inserted into reactor with pressure ranging between 20 and 50 Pa. The plasmas were excited from RF, operating frequency of 13.56 Hz, applying 20 W for 5 minutes. To surfaces characterization were used FESEM, AFM and x-ray diffraction techniques, as well as contact angle measure. The composition of deposited films was investigated by FTIR and the drugs release by UV spectroscopy. Surfaces were investigated using scanning electron microscope (SEM) and thin-film X-ray diffraction. Contact angle measurements were carried out in order to evaluate the wettability. The results indicate that plasma deposition controlled drug release.

**Keywords:** Titanium, molybdenum, biomimetic, plasma, coating, drug release.

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