

Silver coating of Cp-Titanium by Plasma Polymerization of Acrylic Acid

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This study was to determine the effect of plasma polymerization treatments of commercially pure (cp) titanium (Ti) samples surface on properties of acrylic acid films. Cp titanium sheet (15 mm x 15 mm) was used to two different surface treatments, including, etching with an HCl/H₂SO₄ solution and non-treated bare Ti sheet. We carried out two step plasma deposition process. The first step was treated by 80W for 5 min and then second step was performed by 20W-60W for 20 min and then ion-exchanged with Ag⁺ ions in 0.1 N AgNO₃ solution for 30 min. Fourier transform infrared (FTIR) was used to study the effect of second step plasma power on the structure of the AA films. The peak of C=O intensifies as the plasma power at 40 W, indicating a strong plasma power dependence. The content of carboxyl groups were evaluated by toluidine blue O (TBO) assay and contact angle. These results showed that acid etched Ti sample displayed lower contact angle (32°) and more carboxyl group. SEM images showed that thin film of the AA layer was uniformly deposited on the cp Ti surfaces. These results suggest that plasma polymerization treatment for cp-Ti may improve hydrophilicity and have functional group.