

Abstract Submitted
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The Influence of Different Treatments of Surface Chemistry on Titanium via X-Ray Photoemission Spectroscopy DAVID BERNARD, HANNAH SENEDIK, ERUJ ARIF, VERONICA MARCELLA, LAUREN DEBOW, PATRICK MCWHORTER, HOLLY MARTIN, SNJEZANA BALAZ, Youngstown State University — Various implant grade titanium analogs were treated with non-carcinogenic deposition agents (acetone, heptane, ethanol) and compared with a carcinogenic deposition agent toluene to determine the effect that each method has on the surface chemistry of the analog. For use in biological implants, a non-carcinogenic solution such as these would be required by the Food and Drug Administration (FDA). Our study focused on the surface chemistry between treatments as well as investigating different bonding characteristics of the various agents using X-Ray Photoemission Spectroscopy (XPS) in an Ultra High Vacuum (UHV). Each analog was passivated, submerged in ultra pure water, submerged in an APTES solution containing the deposition agent, submerged in glutaraldehyde, and a deposition of chitosan. Between each stage the analogs were analyzed via XPS examining oxygen, carbon, nitrogen, and silicon at high resolution to determine the subtle differences in bonding characteristics while titanium was examined to determine the completeness of adhesion of the chitosan to the titanium substrate.

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