

## Modification and Surface Characterization of the Co<sub>20</sub>Cr<sub>15</sub>W<sub>10</sub>Ni Alloy for Application as Biomaterial

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**Abstract :** CoCr alloys are widely used in prosthetic implants due to their excellent mechanical properties, such as good tensile strength, elastic modulus and wear resistance. Their biocompatibility and lack of corrosion are also prominent features of this alloy. One of the most effective and simple ways to protect metal's surfaces are treatments, such as electrochemical oxidation by passivation, which is used as a protect release of metallic ions. Another useful treatment is the electropolishing, which is used to reduce the carbide concentration and protrusion at the implanted surface. Electropolishing is a cheap and effective method for treatment of implants, which generally has complex geometries. The purpose of this study is surface modification of the alloy CoCr(ASTM F90-09) by different methods: polishing, electro polishing, passivation and heat treatment for application as biomaterials. The modification of the surface was studied and characterized by SEM, profilometry, wettability and compared to the surface of the samples untreated. The heat treatment and of passivation increased roughness (0.477  $\mu\text{m}$  and 0.825  $\mu\text{m}$ ) the samples in relation the sample electropolished and polished(0.131  $\mu\text{m}$  and 0.274  $\mu\text{m}$ ) and were observed the improve wettability's with the increase the roughness.

**Keywords :** biomaterial, CoCr, surface treatment, heat treatment, roughness

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