

## **A STUDY OF EPD TECHNIQUE TO DEPOSIT OF BIO CERAMICS ON STAINLESS STEEL 316L USED FOR SURGICAL IMPLANTS APPLICATIONS**

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### **Abstract**

In this work, the electrophoretic deposition (EPD) is used to deposit three types of nano bioceramics powder including (hydroxyapatite, tetania, alumina), the substrate used for applying the coatings is biomedical stainless steel 316L (st-st). EPD technique is used to achieve the coatings at different deposition times including (1, 3, 5, 7 min.) at constant potential of 60 V, for each one of three types of nano bioceramics. The corrosion test was performed on uncoated and coated specimens using simulated body fluid (SBF) as an electrolyte. The corrosion parameters (such as polarization potential ( $E_{corr}$ ), current density ( $I_{corr}$ ) and corrosion rate (C.R)) were determined, The results show that  $I_{corr}$  and C.R of all coated specimens are lower than uncoated specimen, these results indicate that all types of ceramic coating layers used can act as protective layers on specimen and improve the overall corrosion performance. Also it can observe that  $I_{corr}$  and C.R of coated specimens by EPD decrease with increase in deposition time, which attributed to the effect of bioceramics coating layer that may act as a barrier between the substrate surface and solution. Optical microscope was used to characterize the microstructure of uncoated and coated specimens, rough and porous surfaces gained from coatings. Coating thickness measurements for all coated specimens indicate that increasing the thickness of coating layer with increase in deposition time.

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**Keywords:** Electrophoretic deposition, Bioceramics, Stainless steel 316L, Corrosion resistance.