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## Characterization of nanobiocomposite functionally graded YSZ/HAP prepared by electrophoretic deposition for biomedical applications

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This work describes preparation functionally graded coating of YSZ/HAP on stainless steel 316L as a substrate via electrophoretic deposition. Four layers (100%YSZ), (70% YSZ+30% HAP), (30% YSZ+70% HAP) and (100% HAP) were deposited on thin layer of chitosan. Also nano particles of chitosan were used as a binder material in all (FGMs) layers instead of sintering step. Ethanol with 5% deionized water was used as a suspension for deposition procedure, pH value performed at 4 which fitted by using acetic acid. Four parameters were used in EPD procedure (time, voltage, concentration and temperature) Stability of solutions was measured by zeta potential that showed the high value of zeta potential for FGMs solution than the solution of single layer. The microstructure of surface coating and thickness of layers were characterized by optical microscopy and SEM that showed homogeneity and crack free. Thickness of single and FGM layers that obtained is varied between (12-85  $\mu\text{m}$ ). Hydrophilicity property was investigated by wettability test which the result showed the super hydrophilicity for FGMs as compared with single coating layer.

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