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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 μm). Hydrophilicity property was investigated by wettability test which the result showed the super hydrophilicity for FGMs as compared with single coating layer.

Biography

Mrs. Makarim H. Abdulkareem is a PhD student in production engineering and Metallurgy/University of Technology/Baghdad/Iraq. She is working as a Lecturer from 1994 at the same school where she completed her studies. She had her bachelor in 1994 in Mechanical engineering and in 2000 she had her MSc in Metallurgy engineering, she had study the Surface Engineering, the PhD thesis subject concern with the electrophoretic deposition of nanobiocomposite material. She has contributed greatly to the understanding of surface engineering of materials and deposition of nanobiocomposite material. Also she is a member in (TMS, JOM, AIST and MRS) and she has published many research articles her field.

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