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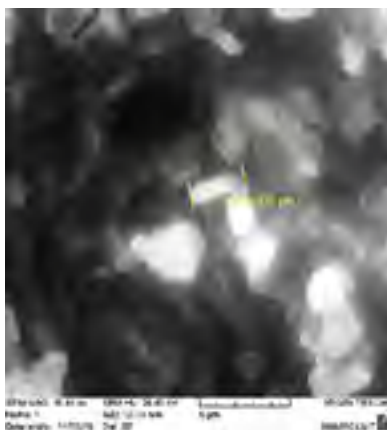
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Antibacterial activity of functionally graded coating HAP/YSZ deposited on SS 316L by electrophoretic deposition

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Antibacterial activity was evaluated *in vitro* on functionally graded coating (FGM) hydroxyapatite/yttria stabilized zirconia coatings prepared by electrophoretic deposition on substrate of stainless steel 316L. Chitosan was used as a thin film on substrate and binder for coating layers. In this study two cases of functionally graded coatings were analyzed. Different processing parameter were employed (Voltage, time, concentration, and temperature) for deposition.

The antibacterial activity test performed using N. agar and diffusion methods. Two types of bacteria, *E. Coli*, and *Staphylococcus* were investigated on the performance of FGM. The results showed that the FGM coatings revealed good inhibition effect towards *E. coli* and *Staphylococcus* within the incubation period. The effect against *Staphylococcus* (gram positive) was more than the effect against the *E. coli* (gram negative). The high percentage of killed bacteria colonies for two kinds (*E. coli* and *S. aureus*) are high. Shape and dimensions of bacteria were investigated by optical microscope (OM) and scanning electron microscopy (SEM). It was found that the cell shape of *E. coli* gram negative bacteria in living state is rod shape with length of about 2- 3 μm . The cell shape of gram positive *Staphylococcus* is circular with diameter about 1.84 μm .



Biography

Makarim H. Abdulkareem is a Ph.D. 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 is study. She had her bachelor in 1994 in Metallurgy engineering, and in 2000 she had her M.Sc. in Metallurgy engineering, she had study the Surface Engineering, the Ph.D. thesis subject concern with the electrophoretic deposition of nanobiocomposite material. Mrs. Makarim A. Abdulkareem 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 have published many research in her field.

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