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Improving corrosion resistance of porous nitinol samples by coating nano oxide layer through different methods

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In this project, we did different surface treatments on 6 samples of nitinol with 40 % porosity. Three of them were anodized by H_2SO_4, HF, Acetic acid, one of them was treated with plasma spray by TIO_2 powder (7.8 micron), one of them was put in furnace at 700 centigrade degrees for an hour, and the last one was bare. Moreover, we put these treated samples in simulated body fluid for 16 days, after this period of time we analyzed the results of morphology of the coated layers. Then we investigated the adhesion amount of osteo blast cells (MG 63) to these samples by immersing them in the cells for 3 days.

The results were investigated by SEM, XRD (X pertpro produced by Panalitical), XRF (530-XRF-01), AAS (AA240), Roughness measuring instrument (WP140), and Optical microscope.

Results revealed that the sample with plasma spray treatment had best results in Nickel releasing, cell adhesion, corrosion in HANKS solution because of couple of reasons: dense oxide layer which has been coated on its surface, Furthermore the composition of the oxide layer which was only different forms of Ti oxides. Moreover, no wonder that apatite layer precipitate more easily on the Ti oxide layers than other sub layers.

Biography

Mehrdad Fattahzade has completed his MA at the age of 25 years from Sharif University and started Ph.D. studies in Shiraz University in bio medical field.

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