

[Congress]
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Coating glass-ceramics bioactive based on Nb₂O₅-SiO₂-CaO-Na₂O system

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The request for biomaterials which interact and provide proper feedback to bodily environment is increasing and so, the need for alternative materials development, from the process or biological feedback points of view, is a necessity. In this context, glass and glass-ceramic are interesting alternatives due to their chemical and structural characteristics possibilities. The surface coating of a specific implant with bioglass associated to biocide activity can lead to a significant impact on patient life quality, reducing risks associated to prostheses replacement due to infections, which is currently one of the most concerning and important factors in implantology. In this work, glass-ceramic materials based on SiO₂-CaO-Na₂O system containing different percentages of Nb₂O₅ were developed. Glasses were melted at 1500°C and thermally treated at 750°C-2h. The materials were characterized by X-Ray Diffraction (XRD), to analyses indicated partial crystallization of glassy matrix. The Fourier Transform Infrared (FTIR) Spectroscopy and Dilatometry also were used to structural and thermal behavior analyses respectively. Citotoxicity tests were performed using neutral red uptake methodology and indicated normal cell growth, which enables the use as biomaterial. Biocide activity was evaluated through glass-ceramic incubation in bacterial suspension (*Escherichia coli*) at 37°C under shaking. A composition with higher contents of SiO₂ and Nb₂O₅ presented higher biocide activity and coefficient of thermal expansion (CTE) evaluated indicate thermal connection with stainless steel 316L and titanium alloys.

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External scientific journals - Are you interested in a publication (to external demand)?

YES - PUBLICATION_Extern

Select your Conference topics (a topic!)

TOPIC_H - Ceramic coatings for structural, environmental, functional and bioapplications

Type of Presentation

POSTER