**Low-temperature-derived composites of bioactive nanoglass for biomedical applications**

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The restoration of bone tissue with the use of nano-bioglass, which is a precursor to the formation of apatites, is a modern method used in traumatology, orthopedy, gerontology, and also in conservative dentistry.

Hereby, we present studies on nanocomposites based on particles of bioactive CaO–SiO2–P2O5 glass obtained by a reverse micelle method. The low-temperature process proposed here allows for the introduction into the composites of compounds that would decompose if these materials were obtained by commonly used methods (as a result of high-temperature treatment). In this way, the nanometric glass particles were modified by zirconium(IV) phthalocyanine complexes of transition metals or by nanometric graphite oxide flakes. These systems indicate particular properties, such as reactive oxygen species generation under red light irradiation, antimicrobial activity, or ability to form a hydroxyapatite layer on their surface, which can be very attractive for medical and biological applications. The paper presents the results of the structural, morphological, optical, and biological characterization of the investigated materials. Bioactivity was tested by immersion of materials in phosphate buffer to control hydroxyapatite formation on their surface. Photoactivity was tested by ability to generate single oxygen during irradiation. The synergic action or interaction of graphene-based structure in composite materials is also discussed.

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