Journal of Composites Science

an Open Access Journal by MDPI

CiteScore: 5.8
Impact Factor: 3.7

Special Issue Reprint

Bioceramic Composites

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Biomaterials are the outcome of a dynamic field of research that is driven by a growing demand and by the competition among the manufacturers of medical devices, with innovations improving the performance of existing devices and that contribute to the development of new ones. The collection of papers forming this volume is addressing a particular class of biomaterials, i.e. ceramic (bioceramic) composites.
Today, Alumina–zirconia bioceramic composites are the golden standard in joint replacements. Several manufacturers have proposed different zirconia–alumina composites for use in hip, knee, and shoulder joint replacements, as well as in dental implants, while several other innovative devices are under study. In addition, bioceramic composites with innovative compositions are under development and will be on the market in years to come. Something that is especially interesting is the application of bioceramic composites in the regeneration of bone tissues. Research has devoted special attention to the doping of well-known materials (i.e., calcium phosphates and silicates) with bioactive ions, aiming to enhance the osteogenic ability and bioresorbability of man-made grafts.
Moreover, high expectations rely on hybrid biopolymer/ceramic materials that mimic the complex composition and multiscale structure of bone tissue.
This volume gathers contributions from researchers working on bioceramic composites with different approaches, i.e. material, biologic and clinical. It is intended to stimulate the interest of young researchers and to be a reference for students and scholars in the field of biomaterials science.

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