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Polymer-Based Composite Nanomaterials: Structure, Properties and Applications

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Message from the Guest Editors

Polymer-based composite nanomaterials are widely used in almost all fields of modern techniques and medicine. Composite matrices of graphene–nanotube structures serve as a base of polymer biocompatible nanomaterials used for the design of implants for tissue engineering. High-performance MXene-based polymer nanocomposites are already produced, in particular, on the base of Ti_3C_2. Ultrathin 2D PMMA/$Ti_2Si_{0.75}Al_{0.25}C_2$ nanosheet composites demonstrate outstanding thermal and mechanical properties, including improved thermal conductivity, increased Young's modulus, and reduced thermal expansion compared to bulk samples and PMMA. Herewith, one of the main challenges in this direction is obtaining a stable polymer-based composite nanomaterials structure that provides the specified properties. Such materials are complex since they consist of different layers, and thus, special attention should be paid to them. Topology and layering also determine physical properties, and it is also required to explore the possibilities of expanding polymer-based composite nanomaterials applications and to search for new applications.

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Message from the Editor-in-Chief

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