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Up-conversion nanoparticles and their hybrid assemblies for biomedical applications 1277

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The progress in the design of photoluminescent assemblies based on up-conversion nanoparticles (UCNPs) meant for biomedical applications is analyzed. The key approaches to the synthesis of bright UCNPs and their surface modification, including embedding into a hydrophilic shell and providing with therapeutic targeting agents, are described. The range of potential applications of UCNPs in analytical biochemistry, biomedical diagnostics and in the therapy of cancer and infectious diseases is considered.

Bibliography — 145 references.

Colloidal quantum dots: synthesis, properties and applications 1297

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The most important results obtained over the last few years for the new class of fluorophores, colloidal quantum dots, are analyzed. The state-of-the-art methods of synthesis and post-synthetic treatment of colloidal quantum dots that make it possible to achieve extremely high luminescent quantum yields and to modify their characteristics for specific applications are considered. The present-day lines of research of colloidal quantum dots and the problems and prospects of their practical applications in various fields are discussed.

Bibliography — 272 references.

Chemical approach to the design of effective antidiabetic agents

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The review discusses the literature data on the structures of hypoglycemic compounds with various mechanisms of action. It is shown that many drugs acting on different biological targets have similar or identical structural moieties. Compounds containing a sulfonyl group, a 3-phenylpropanoic acid moiety, indane ring or heterocyclic (quinoline, isoquinoline, benzoxazine, thiazolidine and other) residues are presented. The approach to the design of multi-target hypoglycemic drugs by combining different pharmacophore groups in one molecule is considered. The prospects of using these agents for the treatment of type 2 diabetes mellitus are discussed.

Bibliography — 117 references.

Organic electroluminescence materials and devices emitting in UV and IR regions

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Literature data on the organic materials capable of generating electroluminescence in the UV (200–400 nm) and near-IR (700–2000 nm) ranges are summarized and systematically represented. The range of relevant substances includes organic, organometallic and coordination compounds. Comparative analysis of the materials is given, the composition and operating characteristics of light emitting diodes based on them are presented and the possible mechanisms of electroluminescence generation are discussed.

Bibliography — 173 references.