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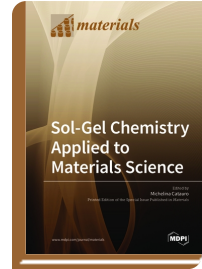
Sol-Gel Chemistry Applied to Materials Science

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Sol-gel technology is a contemporary advancement in science that requires taking a multidisciplinary approach with regard to its various applications. This book highlights some applications of the sol-gel technology, including protective coatings, catalysts, piezoelectric devices, wave guides, lenses, high-strength ceramics, superconductors, synthesis of nanoparticles, and insulating materials. In particular, for biotechnological applications, biomolecules or the incorporation of bioactive substances into the sol-gel matrix has been extensively studied and has been a challenge for many researchers. Some sol-gel materials are widely applied in light-emitting diodes, solar cells, sensing, catalysis, integration in photovoltaic devices, and more recently in biosensing, bioimaging, or medical diagnosis; others can be considered excellent drug delivery systems. The goal of an ideal drug delivery system is the prompt delivery of a therapeutic amount of the drug to the proper site in the body, where the desired drug concentration can be maintained. The interactions between drugs and the sol-gel system can affect the release rate. In conclusion, the sol-gel synthesis method offers mixing at the molecular level and is able to improve the chemical homogeneity of the resulting composite. This opens new doors not only regarding compositions of previously unattainable materials, but also to unique structures with different applications.



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