Summary and Outlook

Organic-inorganic nanohybrids have excellent properties due to a combination of the properties of organic and inorganic materials in a single material. These technical advantages of organic-inorganic nanohybrids are useful for applying the materials in diverse fields. Moreover the growth of nanotechnology over the past few decades has also increased the advantages and uses of organic-inorganic nanohybrids with huge financial support for wider nanotechnological approaches. In particular, organic-inorganic nanohybrid materials are used in various energy, environmental, and biomedical applications.

Currently, organic-inorganic nanohybrids are used to develop many commercial products. Moreover, organic-inorganic nanohybrids are used in the synthesis and fabrication of materials with varying surface properties, such as hydrophilic, hydrophobic, superhydrophobic, ominiphobic, amphiphobic, and superamphiphobic coatings. On the basis of their surface properties and nature, these mateirals are used in a wide variety of applications, such as oil sorption and separation; photocatalysis; corrosion and scratch resistance; anti-icing, antifouling, antireflection coatings; sensors; biomedical applications and drug delivery; organic dyes; and metal ion adsorption.

This book especially covers the synthesis, fabrication, and applications of hydrophobic and superhydrophobic organic-inorganic nanohybrids. Because of their partial and complete water-repellent properties, hydrophobic and superhydrophobic organic-inorganic nanohybrids used for the development of hydrophobic

and superhydrophobic coatings can be applied easily to various substrates to improve the surface properties of the coated substrates.

This book will be useful for readers in interdisciplinary areas of research.

The present and future needs of the synthesis, fabrication, and applications of organic-inorganic nanohybrids are to develop environmentally friendly and solvent-free materials. Currently, some innovative studies have been carried for the development of solvent-free and environmentally friendly organic-inorganic nanohybrids with hydrophobic and superhydrophobic properties.

Environmentally friendly, solvent-free organic-inorganic nanohybrid coating materials are expected to be a major focus in the future to reduce the production costs and consumption of organic solvents and be used on any substrate.

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In materials chemistry, hybrid systems have become popular because of their enhanced properties compared to their individual components. Organic-inorganic hybrid materials have dual, enhanced chemical, thermal, and mechanical properties of both organic and inorganic materials in a single material and are used in various applications. An enhanced hybrid material has many technical advantages compared to single organic or inorganic materials. These technical advantages and the applications of organic-inorganic hybrid materials have been covered by several scientific papers, reviews, and books. This book, however, exclusively covers hydrophobic and superhydrophobic surfaces based on organic-inorganic nanohybrids, their synthesis and fabrication, and their recent and potential applications in various fields. The book is a good reference for understanding the surface properties of organic-inorganic nanohybrids and also a valuable guide for college/high school, undergraduate, and graduate students and scientists with a background in chemistry, chemical engineering, materials science and engineering, nanotechnology, surface science and engineering, or industrial coatings.

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