

EDITORIAL

Special Issue

Fusion Materials: Creative development of materials and exploration of their function through molecular control

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This special issue collects papers on materials produced by members of the MEXT (Ministry of Education, Culture, Sports, Science and Technology) project (<https://www.fusion-materials.org/en/>) entitled Fusion Materials: Creative Development of Materials and Exploration of Their Function through Molecular Control. This is the scheme of Grant-in-Aid for Scientific Research on Innovative Areas (2010–2014). This new concept, Fusion Materials, will open up new areas of sophisticated materials where organic polymers and inorganic substances form self-assembled highly functional structures in which components are harmonized. This Fusion Materials project focuses on innovative research for the syntheses of futuristic materials. Environmentally friendly and highly functional materials are produced through processes with efficient use of energy and resources. This approach is inspired by an attractive strategy in nature, biomineralization for materials synthesis.^{1–4} In biomineralization processes, sophisticated organic–inorganic composite structures such as teeth, bones, seashells and exoskeletons are produced and have excellent properties. Molecular control is key in this process, and biomolecules precisely control the crystallization of inorganic substances. Our aim is to create sustainable materials for the future society in harmony with the environment comprising a wide variety of materials of organic polymers and inorganic substances. It is also important that experts from many scientific areas including organic chemistry, polymer science, inorganic chemistry, physics, biology and engineering create these fusion materials together.

This issue contains contributions including 6 Focus Reviews and 17 Original Articles from more than 20 principal investigators of the Fusion Materials project. This issue covers design, synthesis, processes, functionalization, simulation and theory of fusion materials:

organic/inorganic hybrids; metal complexes; nanoparticle-based hybrids; polymers and gels.

The Editors would like to introduce special issues^{5,6} on self-assembled materials and bio-related polymers, which contain materials relevant to fusion materials. Finally, the editors would like to thank all authors and referees for their great contributions to this special issue.

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