Preface

To date, organic-inorganic hybrid materials have attracted enormous attention and have thus been extensively developed. Typical examples include polymer-based hybrid materials, containing nanostructured metal oxides and clusters bearing organic groups, such as silsesquioxanes, and intercalation and inclusion compounds. Ceramic materials, such as nano- and meso-structured ceramic materials and porous and layered materials also play an important role in developing hybrid materials. Hybrid materials are an exceptional example of new science occurring at the interface between many fields, including polymer science, inorganic chemistry, organometallic chemistry, and colloid chemistry, they will affect growth in all of these interdisciplinary fields especially ceramic science.

This special issue aims to provide diverse examples of recent progress in organic-inorganic hybrid materials with aspects ranging from preparation to properties to applications. The regional and guest editors hope that this special issue will serve as a reference for cutting-edge research for organic-inorganic hybrid materials for years to come.

This special issue of the Journal of the Ceramic Society of Japan contains 20 articles. Most of the articles were submitted based on invitations by the regional and guest editors. All the manuscripts published in this issue were peer-reviewed according to the editorial policies of the journal, and only those meeting the criteria were accepted for publication.

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Guest Editor and Editor in Chief of the Journal of the Ceramic Society of Japan
Reviews

Hybrid metal oxide@biopolymer materials precursors of metal oxides and metal oxide-carbon composites
Sandrine PLUMEJEAU, Johan Gilbert ALAUZUN and Bruno BOURY

DOI http://dx.doi.org/10.2109/jcersj2.123.695

Sol–gel processing of phosphonate-based organic–inorganic hybrid materials
Pierre Hubert MUTIN, Gilles GUERRERO and Johan Gilbert ALAUZUN

DOI http://dx.doi.org/10.2109/jcersj2.123.709

Papers

Novel soft touch silicone beads from methyltrimethoxysilane and dimethyldimethoxysilane using easy aqueous solution reaction
Reiichiro TSUCHIYA, Takumi TANAKA, Gen HAYASE, Kazuyoshi KANAMORI and Kazuki NAKANISHI

DOI http://dx.doi.org/10.2109/jcersj2.123.714

Novel hybrid luminescent materials derived from multicarboxy cage silsesquioxanes and terbium ion
Liguo LI, Shengyu FENG and Hongzhi LIU

DOI http://dx.doi.org/10.2109/jcersj2.123.719

Facile thiol-ene reactions of vinyl T10/T12 silsesquioxanes for controlled refractive indices for transparent fiber glass reinforced composites
Michael Z. ASUNCION, David J. KRUG III, Haya W. ABU-SEIR and Richard M. LAINE

DOI http://dx.doi.org/10.2109/jcersj2.123.725

Polymer-derived amorphous silica-based inorganic–organic hybrids having alkoxy groups: intermediates for synthesizing microporous amorphous silica materials
Mohd Nazri MOHD SOKRI, Takahiro ONISHI, Zineb MOULINE, Yusuke DAIKO, Sawao HONDA and Yuji IWAMOTO

DOI http://dx.doi.org/10.2109/jcersj2.123.732

Preparation of POSS derivatives by the dehydrogenative condensation of T8H with alcohols
Satoru TSUKADA, Yusuke SEKIGUCHI, Shoito TAKAI, Yoshimoto ABE and Takahiro GUNJI

DOI http://dx.doi.org/10.2109/jcersj2.123.739

pH effect on the characteristics of mineralized self-assembled polymeric nanocomposites as controlled drug release carriers
Kyoung Dan SON and Young-Jin KIM

DOI http://dx.doi.org/10.2109/jcersj2.123.744

Synthesis of picolinate-iron(III) compounds through an aqueous solution process
Junki SATO, Makoto KOBAYASHI, Hideki KATO, Eunsang KWON and Masato KAKIHANA

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Microporous inorganic/organic hybrids via oxysilylation of a cubic symmetry nanobuilding block [(HMe2SiOSiO1.5)8] with RxSi(OEt)4-x
David PAN, Eongyu YI, Phi H. DOAN, Joseph C. FURGAL, Matthew SCHWARTZ, Sarah CLARK, Theodore GOODSON III and Richard M. LAINE

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Nucleophilic substitution on silica surfaces: Comparison of the reactivity of α- versus γ-chlorosubstituted silanes in the reaction with sodium azide
Miriam KEPELER, Jürgen HOLZBOCK, Johanna AKBARZADEH, Herwig PETERLIK and Nicola HÜSING

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Synthesis of hierarchically porous polymethylsilsequinoxane monoliths with controlled mesopores for HPLC separation

Yang ZHU, Yoshie MORIMOTO, Taiyo SHIMIZU, Kei MORISATO, Kazuyuki TAKEDA, Kazuyoshi KANAMORI and Kazuki NAKANISHI

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Synthesis and characterization of organoamine-functionalized amorphous silica materials for CO₂-selective membranes

Zineb MOULINE, Kota ASAI, Akira KAWAI, Koichiro SEKIMOOTO, Takahiro ONISHI, Yusuke DAIKO, Sawao HONDA and Yuji IWAMOTO

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Fluorescent hybrid organic–inorganic particles: influence of physical encapsulation versus covalent attachment on leaching and UV stability

Stephanie H. TOLBERT and Douglas A. LOY

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A study of photoreactions in photosensitive TiO₂ hybrid gel films induced by UV irradiation

Hiroyo SEGAWA, Satoru INOUE, Kenji WATANABE, Ryoutarou OHASHI, Hiroyuki NITANI and Masaharu NOMURA

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Directly patternable benzocyclobutene and methacrylate silsesquioxanes for microelectronics packaging

Colin O. HAYES, Brennen K. MUELLER, Philip LIU, William K. BELL, Jared M. SCHWARTZ, R. Paxton THEDFORD, Paul A. KOHL and C. Grant WILLSON

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Technical report

In-situ monitoring of ion-beam luminescence of Si–O–C(–H) ceramics under proton-beam irradiation

Masaki NARISAWA, Masashi KOKA, Akinori TAKEYAMA, Masaki SUGIMOTO, Akira IDESAKI, Takahiro SATOH, Hiroki HOKAZONO, Taketoshi KAWAI and Akihiro IWASE

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Notes

Deposition of plasmonic silver nanoparticles onto semiconducting oxide nanosheets and their photochromic behavior

Teruyuki NAKATO, Sho ISHIDA, Jun-ya KANEDA and Emiko MOURI

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A direct synthesis of the styrylimido derivative of the hexamolybdate dianion

Jeffrey FISCHER, Tiffany STAMPKA and Mark F. ROLL

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