

Isao KIMURA, Ph.D.

Professor

Program: Advanced Materials Science and Technology

Area: Applied Chemistry and Chemical Engineering

Undergraduate: Dept. of Engineering

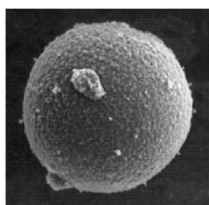
<http://www.gs.niigata-u.ac.jp/~kimlab/index.html>

Professional Expertise

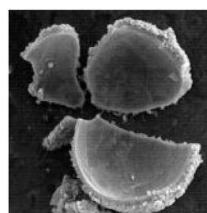
My professional expertise is in the preparation of inorganic, particulate materials, which are referred to in general as microspheres, microcapsules, microcarriers, and so on. They are prepared in liquid-liquid dispersions as the reaction system with the focus of interest on controlling the internal structure according to the desired functions. Recent interests are concentrated into the control of the morphology of calcium phosphate particles and microspheres with the aim of applying them to bioceramics as dental materials.

Research Fields of Interest

- **Bioceramics as Dental Materials**
Preparation and morphology control of fine particles and microspheres made of calcium phosphates such as hydroxyapatite. Application to dental implants.
- **Microspheres and Microcapsules**
Preparation of hollow and porous microspheres made of inorganic substances by using solution syntheses, emulsion techniques, and sol-gel processes. Composites of inorganic substances and polymers.
- **Inorganic Powders and Ceramic Composites**
Preparation of nanoparticles and their application to ceramic composites.



titanium microsphere



fractured view

Education

1994: Ph. D. Eng., Course of Materials Science and Engineering, Graduate School of Engineering, Hokkaido University, Japan

1984: M. Eng., Course of Applied Chemistry, Graduate School of Engineering, Hokkaido University, Japan

1982: B. Eng., Dept. of Applied Chemistry, Faculty of Engineering, Hokkaido University, Japan

Professional Societies and Activities

1. Member: The Ceramic Society of Japan
2. Member: The Chemical Society of Japan
3. Member and Representative: The Society of Chemical Engineers, Japan
4. Member: The American Ceramic Society
5. Member: The American Institute of Chemical Engineers
6. Member: The Society of Powder Technology, Japan
7. Member: The Japanese Society for Dental Materials and Devices
8. Personal member: Japanese Society for Engineering Education
9. Visiting scientist: Rutgers, The State University of New Jersey, USA (2003-2004)
10. Executive Secretary: The Society of Chemical Engineering, Niigata

Major Publications

Papers

*Bioceramics as Dental Materials

- [1] "Effects of organic additives on the morphology of various calcium phosphates prepared via solution and emulsion methods", *IOP Conf. Ser. Mater. Sci. Eng.*, vol.18, doi:10.1088/1757-899X/18/19/192017, 2011.
- [2] "Adhesion of hollow calcium-deficient hydroxyapatite microspheres onto titanium", *Dent. Mater. J.*, vol.28, no.6, pp.700-707, 2009.
- [3] "Preparation of hollow hydroxyapatite microspheres containing magnesium or carbonate by using a multiple emulsion", *Arch. BioCeram. Res.*, vol.7, pp.199-202, 2009.
- [4] "Titanium implant coated with hydroxyapatite microcapsules and poly(L-lactic acid) releasing an antimicrobial agent", *AICHE 2008 Annual Meeting*, 2008.
- [5] "Preparation of hydroxyapatite microspheres by interfacial reaction in a multiple emulsion", *J. Ceram. Soc. Jpn.*, vol.115, no.12, pp.888-893, 2007.
- [6] "Synthesis of hydroxyapatite by interfacial reaction in a multiple emulsion", *Res. Lett. Mater. Sci.*, vol.2007, doi:10.1155/2007/71284, 2007.
- [7] "Preparation of microspherical hydroxyapatite scaffolds", *Conf. Proc. US-Japan Joint Topical Conf. Med. Eng.*, 2006.
- [8] "Effects of stirring on the morphology of hydroxyapatite particles synthesized hydrothermally", *Arch. BioCeram. Res.*, vol.5, pp.336-339, 2005.

*Microspheres and Microcapsules

- [1] "Microencapsulation through the conversion of an inorganic powder layer to the wall material", *4th Joint China/Japan Chem. Eng. Symp.*, 2007.
- [2] "Preparation of silica microspheres by sol-gel process in an O/W dispersion together with addition polymerization for limiting the reaction site", *Int. Symp. Fusion Technol.*, 2007.
- [3] "Preparation of titania microballoons by sol-gel process in reverse dispersion", *Mater. Res. Bull.*, vol.40, no.7, pp.202-209, 2005.
- [4] "Preparation of titania/silica composite microspheres by sol-gel process in reverse suspension", *Mater. Res. Bull.*, vol.38, no.4, pp.585-597, 2003.
- [5] "Preparation of microcapsules containing silver-complex by sol-gel process in reverse suspension", *6th World Congr. Chem. Eng.*, 2001.

- [6] "Preparation of silica particles by sol-gel process in reverse suspension", *J. Mater. Sci.*, vol.34, no.7, pp.1471-1475, 1999.
- [7] "Microencapsulation of thermal-sensitive pigment with inorganic wall material by interfacial reaction in multiple dispersion", *Adv. Powder Technol.*, vol.8, no.1, pp.1-13, 1997.
- [8] "The preparation of microcapsules which include silicon carbide particles in a wall material", *Adv. Powder Technol.*, vol.6, no.3, pp.221-232, 1995.

*Inorganic Powders and Ceramic Composites

- [1] "Synthesis of AlN/SiC composite powders by floating-type fluidized-bed CVD", *Powder Technol.*, vol.68, no.2, pp.153-158, 1991.
- [2] "Preparation of AlN-Al₂O₃ fiber composites by using chemical vapor infiltration", *J. Mater. Sci.*, vol.26, no.1, pp.258-262, 1991.
- [3] "Synthesis of TiN-Al₂O₃ composite powder by floating-type fluidized-bed CVD", *J. Ceram. Soc. Jpn.*, vol.97, no.12, pp.1525-1529, 1989.
- [4] "Sintering and characterization of Al₂O₃-TiB₂ composites", *J. Eur. Ceram. Soc.*, vol.5, no.1, pp.23-27, 1989.
- [5] "Particulate characteristics and deposition features of fine AlN powder synthesized by vapor-phase reaction", *J. Mater. Sci.*, vol.24, no.11, pp.4076-4079, 1989.
- [6] "Effect of alumina and titania additions on properties of porcelain bodies from Murakami sericite", *Ceram. Int.*, vol.14, no.4, pp.217-222, 1988.
- [7] "Synthesis of fine AlN powder by vapor phase reaction of AlCl₃ and NH₃", *J. Ceram. Soc. Jpn.*, vol.96, no.2, pp.206-210, 1988.