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**Organic and Polymeric Materials**

## **1. Highlights in 2007**

Proton Exchange Membranes for Fuel Cells

Reported in *J. Power Sources*, 175, 120-126 (2008)

Hyperbranched polymers (HBP) that have systematic branching structure have many terminals. Polyether sulfone HBP was synthesized from monomers having two sulfonic acid functions. High ion conductive and high thermal stable membranes were prepared by copolymerization of hyperbranched and linear polyethersulfones. Thus, hybrid of hyperbranched and linear polymers were synthesized by aromatic electronic substitution reaction.

Low dielectric Polyimides

Reported in *Macromolecules*, 40, 5698-5705 (2007)

A novel structure of double-decker-shaped silsesquioxane (POSS) was introduced into polyimide main chain to afford low dielectric constant and high thermally stable resins.

## **2. Articles (original article, comment/book)**

1. Synthesis, end-functionalization and characterization of hyperbranched polysiloxysilanes from AB<sub>3</sub> type monomer  
Yoshihito Ishida, Kazutoshi Yokomachi, Kakoto Seino, Teruaki Hayakawa, and Masa-aki Kakimoto  
*Macromol. Rs.*, 15, 147-153(2007)
2. Synthesis and characterization of hyperbranched poly(siloxysilane) possessing Rhodamine B as terminal group  
Lujin Ding, Teruaki Hayakawa, and Masa-aki Kakimoto  
*Polym. J.*, 39, 551-557 (2007)
3. Coupling of hyperbranched and linear poly(ether sulfone)s in the solid state

Stephen J. Grunzinger, Masatoshi Watanabe, Kiyotaka Fukagawa, Yoichi Tominaga, Teruaki Hayakawa, and Masa-aki Kakimoto  
J. Photopolym. Sci. Tech., 20, 193-196 (2007)

4. Synthesis and self-assembling of wholly aromatic block co-oligomers: Oligo(ether sulfone)-b-oligo(ether ketone) with Sulfonic acid terminal groups

Raita Goseki, Teruaki Hayakawa, Masa-aki Kakimoto, Masatoshi Tokita, and Junji Watanabe

J. Photopolym. Sci. Tech., 20, 771-776 (2007)

5. Functionalized Hyperbranched Polymers

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Shokubai, 49, 332-336 (2007)

6. Synthesis and characterization of semiaromatic polyimides containing POSS in main chain derived from double-decker-shaped silsesquioxane

Shouming Wu, Teruaki Hayakawa, Ryohei Kikuchi, Steohen J. Grunzinger, Masa-aki Kakimoto, Hisao Oikawa

Macromolecules, 40, 5698-5705 (2007)

7. Adsorption of Hyperbranched Polysiloxysilane Modified with Triethoxy Group onto the Silicon Wafer

Yasuko Yamada, Tomoyasu Hirai, Ryohei Kikuchi, Teruaki Hayakawa, and Masa-aki Kakimoto

High Perform. Polym., 18, 761-775 (2007)

**3. Presentataion in international/domestic conferences**

None

**4. Others**

None