

Division of Materials Chemistry

– Chemistry of Polymer Materials –



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Scope of Research

We perform kinetic and mechanistic analyses toward understanding chemical and physicochemical reactions occurring in polymerization systems and better routes for synthesis of well-defined polymers. In particular, new well-defined polymers or polymer assemblies are prepared by living polymerization techniques, and their structure–properties relationships are precisely analyzed. Projects in progress include: 1) kinetics and mechanisms of living radical polymerization (LRP); 2) synthesis of new polymeric materials by living polymerizations and their structure/properties studies; and 3) synthesis, properties, and applications of concentrated polymer brushes (CPB).

KEYWORDS

Precision Polymerization
Polymer Brush
Hybrid Materials

Living Radical Polymerization
Tribology



Recent Selected Publications

- Okubo, H.; Hase, K.; Tamamoto, K.; Tsujii, Y.; Nakano, K., In-Situ Observation of Ice-Adhesion Interface Under Tangential Loading: Anti-Icing Mechanism of Hydrophilic PPEGMA Polymer Brush, *Tribol. Lett.*, **72**, 96 (2024).
- Takahashi, Y.; Mizukami, M.; Tsujii, Y.; Kurihara, K., Surface Forces Characterization of Concentrated PMMA Brush Layers under Applied Load and Shear, *Langmuir*, **40**, 325-334 (2023).
- Okubo, H.; Kagiwata, D.; Nakano, K.; Tsujii, Y., Layered Structure and Wear Mechanism of Concentrated Polymer Brushes, *Langmuir*, **39**, 18458-18465 (2023).
- Ishida, K.; Kondo, T., Evaluation of Surface Free Energy Inducing Interfacial Adhesion of Amphiphilic Cellulose Nanofibrils, *Biomacromolecules*, **24**, 3786-3793 (2023).
- Ishida, K.; Kondo, T., Anisotropic Frictional Properties Induced by Cellulose Nanofibril Assembly, *Biomacromolecules*, **24**, 3009-3015 (2023).