

# Creation and Precise Characterization of Polymers with Unique Architectures

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## Polymers with Unique Architectures



Ring



Cage-shaped

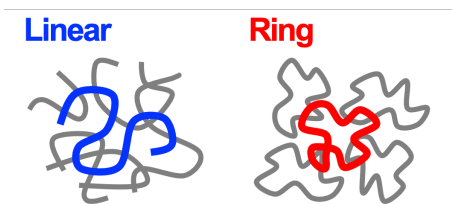


Nano-particles



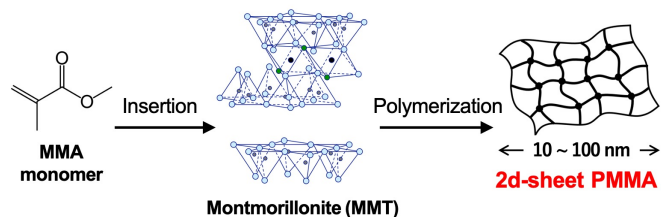
Nano-sheets

### 1. Molecular Properties of Ring Polymers



Highly-purified ring polymers were prepared via our original methods, and their molecular conformations and dynamics were elucidated.

### 2. Synthesis of Sheet-Shaped Polymers



Sheet-shaped polymers were synthesized by planar polymerization of monomers in the interlayer of montmorillonite (MMT) nanoclays.

#### Content:

Understanding the relationship between the structure and properties of polymers is one of the most important issues in polymer science, and is closely related to industry and practical materials. In our laboratory, we are working on preparation of model polymers with unique molecular architectures and elucidation of their molecular properties (i.e., conformations and dynamics on the nanoscale).

Specifically, we have succeeded in preparing some model polymers samples such as “ring polymers” and “sheet-shaped polymers”, and in elucidating their molecular properties by using scattering and rheological methods. In addition to the above polymers, we are currently working to develop preparation methods and understand fundamental properties of polymers with more complex architectures (such as cage-shaped polymers and polymeric nanoparticles).

#### Appealing point:

- We are actively engaged in industry-academia collaboration.
- We contribute to the development of novel polymeric materials based on our skills in polymer synthesis and characterization.

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Research Interest :  
Polymer synthesis, purification, and characterization

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