



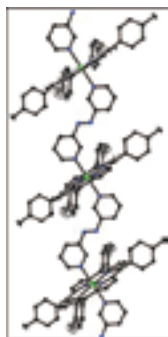
Research/Development Areas

Design Plastics by the Full Use of the Nanotechnology for Future Materials

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Polymers are very important materials that are widely used in our daily life as they have a variety of functions. If the latent functions intrinsic to polymer materials were fully utilizable they could be applied in many more leading-edge fields. In the light of this basic concept our research program focuses on the molecular design and synthesis of highly functionalized and high-performance polymer materials. However, to obtain those highly functionalized polymer materials the primary structures as well as higher structure of the polymers needs to be controlled. Polymers are very large molecules, but they consist of very small units $\sim 1 \text{ nm}$ (10^{-9} m) in size. A large number of those small units are built into polymers. In addition, polymer molecules can spontaneously become organized and construct

higher structures $\sim \mu\text{m}$ (10^{-6} m) in size. We are trying to precisely control the structure at each level by designing nano-size units and developing new materials that make full use of their intrinsic functions. In other words, we are exploring the development of new polymer materials with novel functions and performance by designing molecules at the nano scale for use in future materials.



■ Spontaneous formation of a polymer by designing suitable nano units