



Title of Project : New Polymeric Materials Based on Element-Blocks

Yoshiaki Chujo

(Kyoto University, Graduate School of Engineering, Professor)

【Purpose of the Research Project】

The main purpose of this research project is to establish new and innovative polymeric materials based on “element-blocks”. Recently, organic-inorganic hybrids that have effectively combined properties of organic and inorganic materials and organic polymer materials hybridized with various inorganic elements at the molecular level have been extensively studied as new functional materials, such as electronic device materials. In this research project, such concept of hybridization is applied to element blocks. New element blocks with a variety of elements are synthesized by several approaches including organic, inorganic, and organometallic reactions, which are polymerized, and the polymer integration is studied with respect to the regulation of interface and higher ordered structures in the solid states. Based on this strategy, we develop new innovative element-block polymer materials and establish the new theory of polymeric materials based on element-blocks (Figure 1).

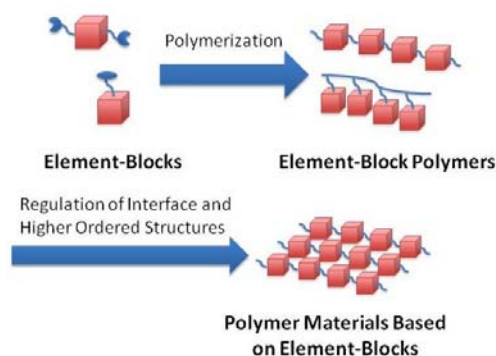


Figure 1. Strategy of research project

【Content of the Research Project】

This research group is composed of four sub-groups which promote the research by close collaboration between them (Figure 2). A01 (Exploration of New Element-Blocks) deals with design and synthesis of new element-blocks, while in A02 (Polymer Synthesis Based on Element-Blocks) and A03 (Regulation of Interface and Higher Ordered Structures), polymerization of the element-blocks, and their nano-sized interface structures, higher ordered structures, non-bonding interaction of the

polymers are studied, respectively. In A04 (Development of New Ideas and Collaboration), theoretical analysis of the element-block polymers is studied to gain new ideas. Collaboration based on new seeds and challenging ideas of element blocks is encouraged in this group.

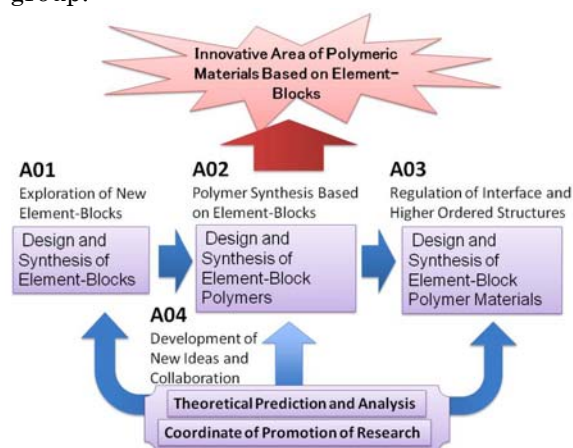


Figure 2. Structure of research group.

【Expected Research Achievements and Scientific Significance】

In this project, not only the development of individual functional materials based on the idea of element-blocks, but also the establishment of a new theory concerning element-blocks, which can provide new ideas of molecular design and methodology of material synthesis are expected.

【Key Word】

Element-blocks: Building units of polymers with a variety of elements

【Term of Project】 FY2012-2016

【Budget Allocation】 1,161,100 Thousand Yen

【Homepage Address and Other Contact Information】

<http://element-block.org>