FUNDING PROGRAM FOR NEXT GENERATION WORLD-LEADING RESEARCHERS

Project Title: Autonomously Self-healing Polymeric Materials Based on Dynamic Covalent Chemistry	
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1. Background of research

A class of smart materials that have the structurally incorporated ability to repair damage caused by mechanical usage over time are called "self-healing materials". Development of self-healing polymeric materials is necessary to reduce environmental burden and to also improve reliability and durability of polymeric materials. Polymeric materials which can autonomously self-heal without stimuli has potential application to various fields.

2. Research objectives

In this project, **dynamic polymeric materials that have the ability to autonomously self-heal without stimuli are being prepared using a novel dynamic covalent bond unit**. This project also focuses on the fundamental science of self-healing polymeric materials based on dynamic covalent bonds.

3. Research characteristics (incl. originality and creativity)

Dynamic covalent chemistry combines the robustness of covalent bonds with the reversibility of non-covalent interactions, which makes it a powerful tool for the synthesis of impressively complex structures under thermodynamic controls. Self-healing process due to the autonomous exchange reactions of dynamic covalent bonds and durability of the self-healing system against moisture are expected.

4. Anticipated effects and future applications of research

Establishment of the new concept in the field of self-healing polymers can facilitate the progress of "green innovation". The anticipated results of this project is also expected to contribute to the realization of a safe and secure society.