Development and structural analysis of high-performance polymer materials

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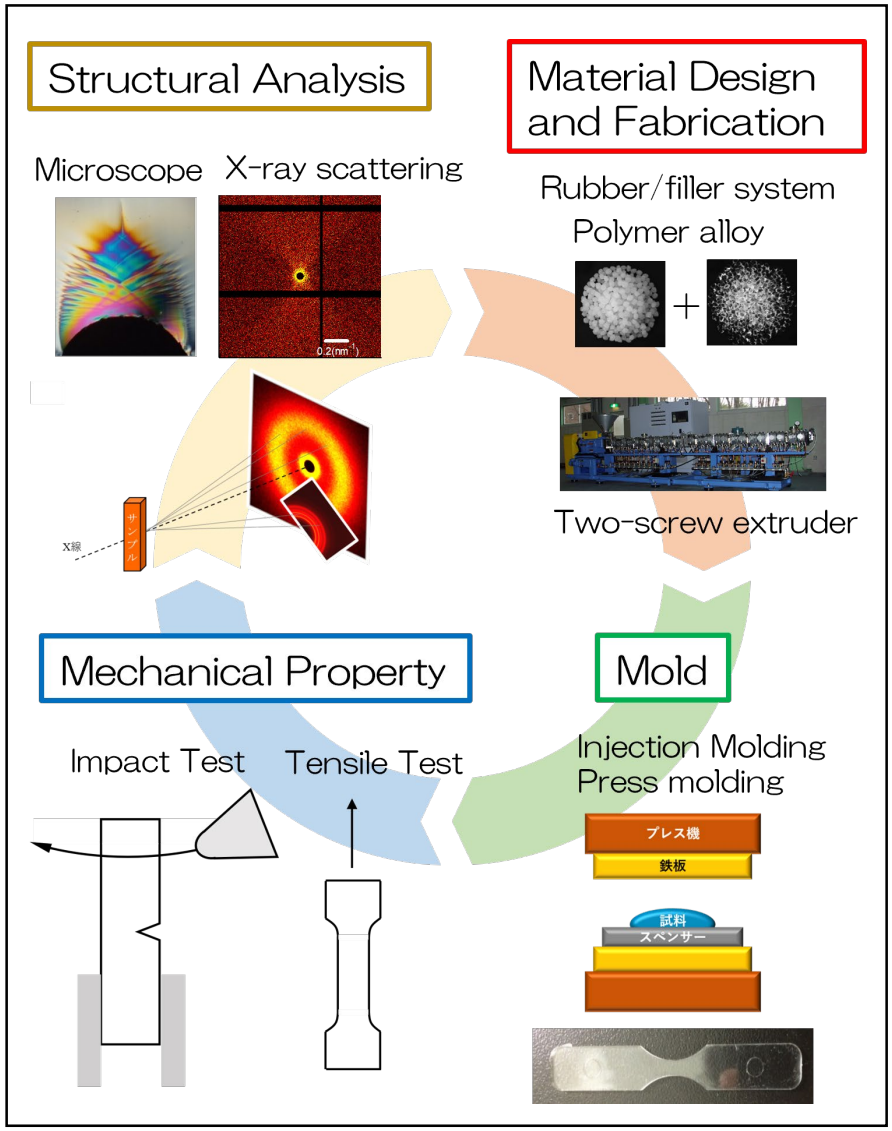

Contents: In this laboratory, a wide range of research is conducted, from material development of polymer alloys and nanocomposites to evaluation of mechanical properties such as tensile and impact tests, as well as structural analysis. Specifically, first, we consider what kind of materials are required for polymer alloys, which are multi-component systems containing two or more polymers, and nanocomposite materials in which fillers are added to rubber, and design the materials. Next, the materials are blended using an extruder. Then, we evaluate the properties of the prepared materials using various evaluation methods. For example, tensile and impact tests. When interesting properties are found, structural analysis is performed to clarify why these properties were found. In addition, we also consider fracture mechanics to establish a guideline on how to improve the properties further. We then conduct research in the process of designing materials again.

Appeal points: Our laboratory is actively involved in industry-academia collaboration in the development of new polymer materials and their structural analysis. My strength is that I can also do all the material fabrication and molding.

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