High-Performance Organic Materials for Photonics and Electronics

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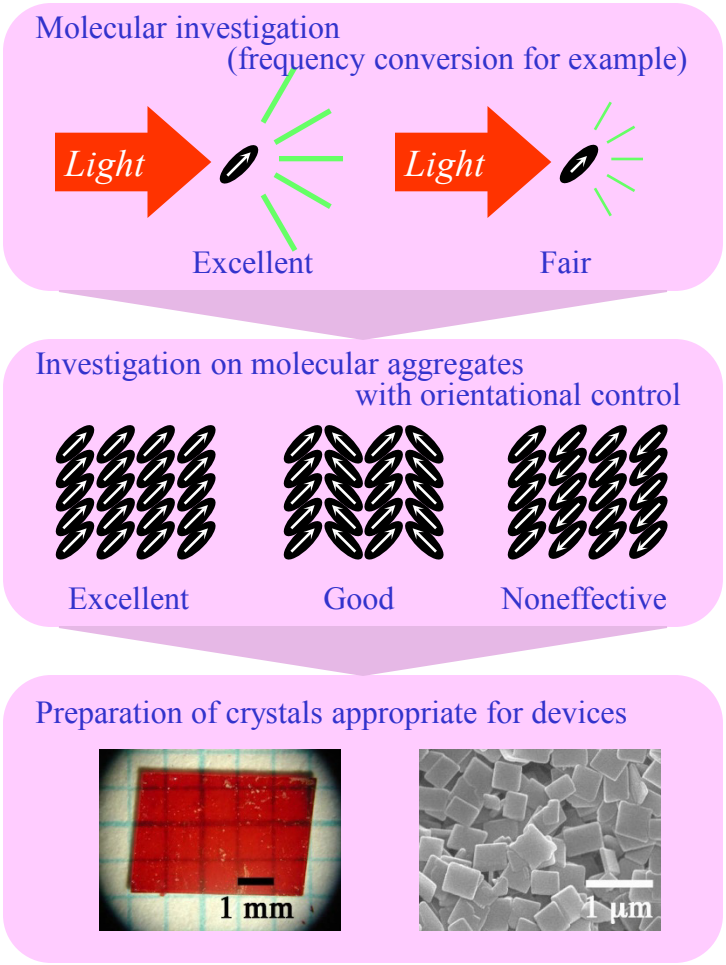

Research flow on organic materials for photonics

Content:

Although a variety of organic compounds with functions on photonics and electronics have been known, there are not so many organics used as practical device materials. Our research topics include molecular designs for optical and electronic functions, molecular orientational control to maximize molecular functions and preparation of molecular aggregates appropriate for the devices.

Examples are ionic dye crystals emitting broad-band and high power terahertz-waves by the second-order nonlinear optical (NLO) effects and π-conjugated polymer crystals for conducting properties and ultrafast optical switching by the third-order NLO effects. For the former crystals, new ones with enhanced NLO properties and improved crystal growth ability are being synthesized. For the latter crystals, novel structure-controlled π-conjugated polymers are being prepared by the solid-state polymerization. Since these crystals are expected to be used for optical devices at present, crystals with millimeter size for laser-beam transmission or with nanometer size for low optical scattering materials are being fabricated.

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