第348回触媒化学研究センターコロキウム

“Precise Engineering of Polymers for Organic Photovoltaics”

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Π-conjugated semiconducting polymers are actively under development for use in light-weight, flexible, disposable organic light-emitting diodes, and thin-film transistors. A key application which is currently attracting a lot of interest for semiconducting polymers is their use in organic photovoltaic devices (OPVs). The main drive for developing OPVs is the lower cost associated with their manufacturing, because of the fact that organic semiconducting polymers can be solution processed. Poly(3-hexylthiophene) (P3HT) remains one of the most commonly used polymers in organic photovoltaics due to its desirable electronic properties. Our group has been studying and developing techniques to grow semiconducting polymers using a living polymerization method. This has allowed us to synthesize polymer architectures that we haven’t been able to access till now including polythiophene brushes, star-shaped P3HT, as well as hyperbranched P3HT. It also allows us to accurately control the molecular weights of P3HT and produce materials with a narrow molecular weight distribution. In this talk, I will talk about the synthetic strategies used, and the thin film morphologies these polymer architectures provide.

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