

演題：1D and 3D Photonic Crystals

(一次元および三次元フォトニック結晶)

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セミナー室2

Brush block copolymers (BBCPs) can be prepared by the polymerization of macromonomers. However, this method intensively requires high-quality macromonomers. Here, we report the combination of living anionic polymerization and ring-opening metathesis polymerization to synthesize the precisely controlled macromonomers and BBCPs.

Norbornene-end-functionalized macromonomers were prepared by living anionic polymerization and ω -end functionalization with a norbornene derivative. BBCPs were synthesized by sequential ROMP of two macromonomers using a Grubbs catalyst. The ROMP was also utilized in the combination of a monomer containing polyhedral oligomeric silsesquioxane (POSS) and a macromonomer to prepare POSS-bottlebrush block copolymers (POSSBBCPs). The self-assembly allow the BBCPs and POSSBBCPs to be converted to 1D PCs with well-defined lamellar nanostructures and distinct light-reflection properties.

In the last section of our presentation, we introduce the self-emulsion polymerization (SEP) technique which was developed in our lab and report one of their application for the 3D photonic application

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