

Preparation of Amylosic Inclusion Supramolecular Soft Materials

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Abstract

Amylose is a polysaccharide with left-handed helical conformation, which is a well-known host molecule forming supramolecular inclusion complexes with hydrophobic guest polymers by ‘vine-twining polymerization’^[1]. The vine-twining polymerization is the method to obtain amylose-polymer inclusion complexes, which is performed in phosphorylase-catalyzed enzymatic polymerization in the presence of hydrophobic guest polymers. In this study, we examined the vine-twining polymerization using an amphiphilic triblock copolymer composed of hydrophobic polytetrahydrofuran (PTHF) and hydrophilic poly(2-methyl-2-oxazoline) (PMeOZO) to obtain amylosic inclusion supramolecular materials. We found that the products formed soft materials such as film and hydrogel (Figure 1). This was because that the PMeOZO chain relaxed the amylose inclusion complex crystallines, resulting in the formation of a higher-order structure different from that of the conventional inclusion complex.

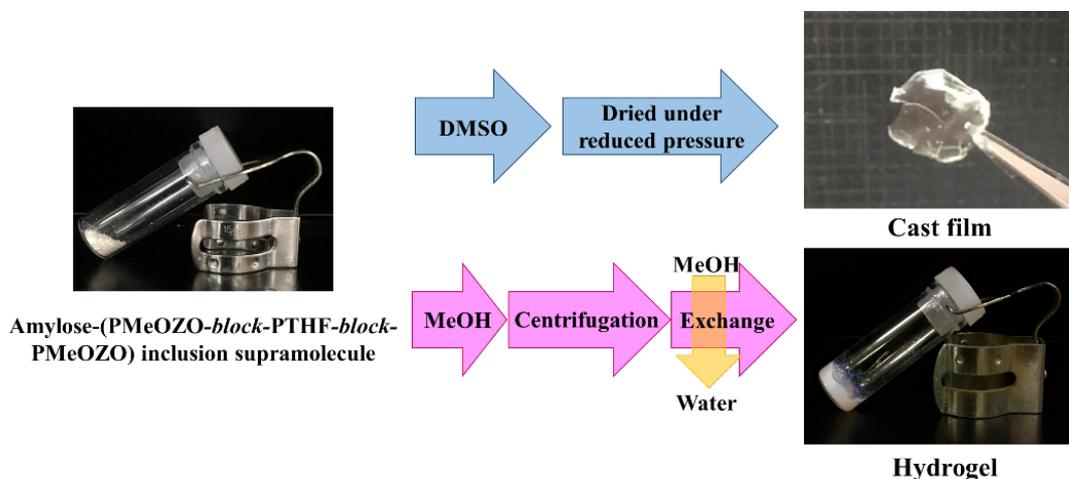


Figure 1. Preparation of cast film and hydrogel from amylose-(PMeOZO-*block*-PTHF-*block*-PMeOZO) inclusion supramolecule.

References

[1] S. Orio, K. Yamamoto, J. Kadokawa, *Polymers.*, 2017, DOI:10.3390/polym9120729

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