

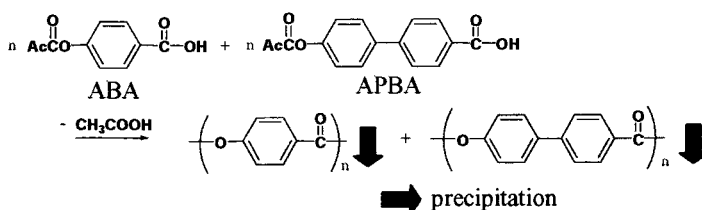
# Polymerization of 4-Acetoxybenzoic Acid and 4-(4-Acetoxyphenyl)benzoic Acid via Reaction-induced Crystallization of Oligomers

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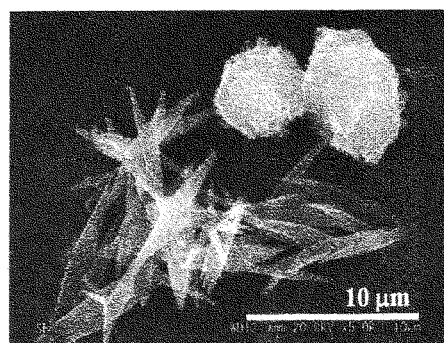
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INTRODUCTION: We had been studying a dual self-assembling polycondensation system by means of phase separation of oligomers, and slab-like polyamide crystals and needle-like polyester crystals were prepared simultaneously by the polymerization of 4-acetoxybenzoic acid (ABA) and 4-acetoamidobenzoic acid. Oligoamides aggregated strongly due to the hydrogen bonding interaction and formed the slab-like crystals. Then the oligoesters were also precipitated to form the needle-like crystals due to the segregation effect. Solid-state polymerization proceeded in the both crystals and two polymer crystals having different habits were finally obtained. This phenomenon was induced by the difference in the oligomer interaction. In this study, a dual self-assembling polycondensation was examined in the polymerization of ABA and 4-(4-acetoxyphenyl)benzoic acid (APBA), in which the hydrogen bonding did not exist.



EXPERIMENTAL: Polymerizations of ABA and APBA were carried out in Barrel Therm 400 (Matsumura Oil Co. Ltd) at 330°C in N<sub>2</sub> with no stirring. Polymerization concentration was 1 %.

RESULTS AND DISCUSSION: Two different kinds of crystals were simultaneously formed at the molar ratio of ABA in feed of 10 mol%, of which one was needle-like crystal and another was fibrillated slab-like crystal as shown in Fig. 1. These morphologies resembled those of corresponding homopolymer crystals.



**Fig. 1** Crystals prepared at the molar ratio of ABA in feed of 10 mol%.

Microscopic IR analysis suggested that these two crystals had different structure. The miscibility of the oligomers prepared from APBA was quite lower than those from ABA, and this large difference in the miscibility may induce the simultaneous formation of two kinds of polymer crystals having different crystal habit.

## References

[1] K. Kimura, K. Kobashi, H. Maeda, Y. Yamashita, *Macromol. Rapid Commun.*, **24**, 190-193 (2003).

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