



The Chinese University of Hong Kong Non-confidential Abstract of Technology Disclosure

Title:

Novel Synthesis of Long Multi-block Heteropolymer Chains with an Ordered Sequence and Controllable Block Lengths

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Inventor:

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Non-confidential abstract:

It had been a very long dream in polymer science to synthesize long multi-block heteropolymer chains with an ordered sequence and controllable block lengths. Using ionic or living free radical polymerization, one can prepare copolymers with few blocks, such as diblock and triblock copolymers. The most plausible result in this direction was penta-block copolymer. In another way, one could attach each end of polymer blocks with a reactive functional group and then couple them together to form a long multi-block heteropolymer chain. However, the functional ends are normally wrapped and hidden inside the coiled polymer blocks in solution and the concentration of the active ends is too low to allow an effective coupling, so that longer polymer chains cannot be formed in such a way. Recently, combining polymer physics and synthetic chemistry, we have invented a novel method to couple 10-100 polymer block chains together to form narrowly distributed long multi-block heteropolymer chains with an ordered sequence and controllable narrowly distributed block lengths.

Application:

- High-value added functional heteropolymers for various special applications can be synthesized through this technique. This technique can extend the production of diblock and triblock copolymers in industry to the production of long multi-block heteropolymers. It is expected that the surface properties of such long multi-block heteropolymers are much better than diblock and triblock copolymers used in the market.

Advantage:

- This is the first time one can effectively prepare long multi-block heteropolymer chains with an ordered sequence and controllable block lengths. The preparation is cheap and the method can be integrated into the existing industrial process.
- The important advantage of using multi-block heteropolymers instead of diblock and triblock copolymers is similar as that of using polyelectrolytes to replace small surfactant molecules.

For further queries, please contact:

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