

## Stimuli-Responsive Smart Polymers Undertaking Linear - Star or Linear - Cyclic Topology Change

**Toshikazu Takata**

*Department of Chemical Science and Engineering, Tokyo Institute of Technology*

Property and function of polymer deeply depend upon its structure, especially its shape or topology. In general polymer topology such as linear, branched, or cyclic shape cannot be changed because such polymer is constructed by covalent bonding and its topology is determined during the synthesis. We have studied the development of stimuli-responsive polymers capable of changing their topologies, which are obtained by linking of polymer chains by rotaxane units. Rotaxane is characterized by its high component mobility due to the mechanical linkage between the components. Herein, we would like to discuss on the polymer topology transformation capable of changing the property and function.

ABC triblock copolymer changed its property and morphology via the topology change from branched to linear shape. High yielding and large quantity synthesis of cyclic polymer were achieved by the rotaxane protocol via linear – cyclic polymer topology transformation. These topology transformations proceeded with ABC or ABABA block copolymers to result in the formation of different sequential copolymers.

Corresponding author e-mail: [ttakata@polymer.titech.ac.jp](mailto:ttakata@polymer.titech.ac.jp)

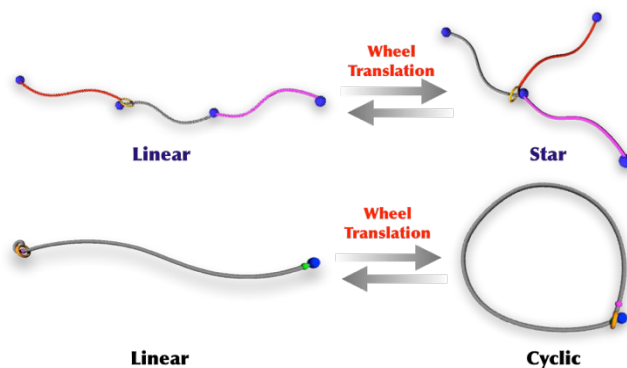


Figure. Stimuli-responsive smart polymers formed by rotaxane-linking of polymer chains and successive topology transformation

**Author Biography:** Prof. Takata was born in Toyama Pref., Japan in 1953. He received his Ph D from Tsukuba University, Tsukuba, Japan in 1981. He has worked at Tokyo Tech (Assist. and Assoc. Prof., 1985-), JAIST (Prof., 1994-), Osaka Pref. Univ. (1995-), and Tokyo Tech (2003-present). He has published more than 430 original paper, 160 book chapter and review, 170 patents.

Name: Toshikazu Takata

University/Institute: Tokyo Institute of Technology

Research Interest: Development of novel substances with unique property and function.

