

## 多重水素結合性官能基を有する新規ビニルモノマーの合成および重合と水素結合型ネットワークポリマーの解架橋制御

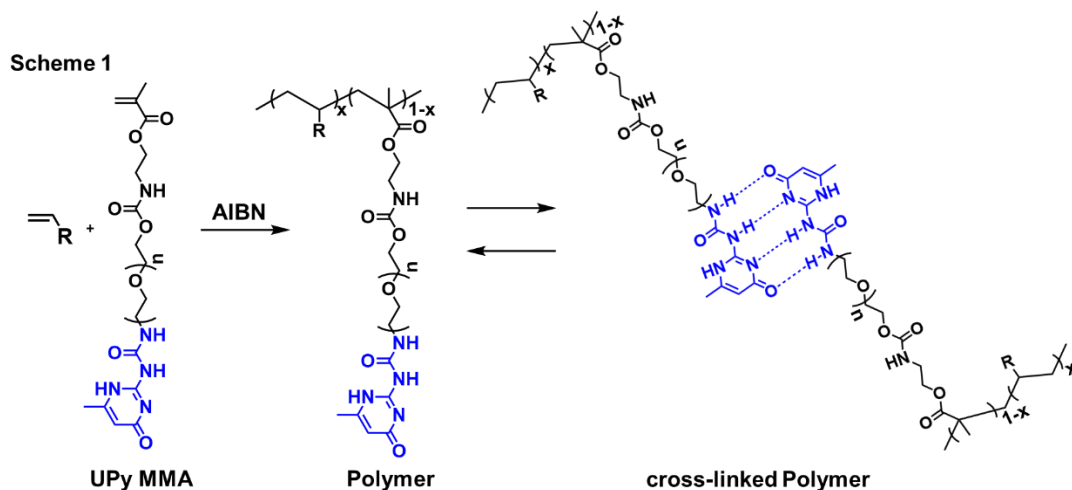
(東工大物質理工<sup>1</sup>・信州大繊維<sup>2</sup>) ○青木 溪汰<sup>1</sup>・増田 清司<sup>1</sup>・湊 遥香<sup>2</sup>・渡邊 拓巳<sup>2</sup>・鈴木 大介<sup>2</sup>・中藺 和子<sup>1</sup>

Synthesis and Polymerization of Vinyl Monomers with Multiple Hydrogen-bonding Functional Groups and Control of Cross-linking and Decross-linking of Hydrogen-bonded Network (<sup>1</sup>*Department of Chemical Science and Engineering, Tokyo Institute of Technology*, <sup>2</sup>*Graduate School of Faculty of Textile Science and Technology, Shinshu University*) ○Keita Aoki,<sup>1</sup> Kiyoshi Masuda,<sup>1</sup> Haruka Minato,<sup>2</sup> Takumi Watanabe,<sup>2</sup> Daisuke Suzuki,<sup>2</sup> Kazuko Nakazono<sup>1</sup>

Ureidopyrimidinones (UPys) are multiple hydrogen bonding units that form four hydrogen bonds to form selective and stable dimers and are used for cross-linking of various polymers.<sup>1</sup> However, UPy skeletons have low solubility in various organic solvents, making it difficult to obtain copolymers in good yields. In this study, we synthesized new vinyl monomers of UPys with flexible chains to improve the solubility in organic solvents and copolymerized them with various vinyl monomers (Scheme 1). The mechanical properties of the hydrogen-bonded network polymers and the conditions for decross-linking were also investigated.

**Keywords :** *Hydrogen Bond Cross-linking; Ureidopyrimidinone; Cross-linked Polymer*

ウレイドピリミジノン (UPy) は分子間で四重の水素結合により選択的かつ安定な二量体を形成する多重水素結合ユニットであることから、可逆的な様々な高分子の架橋に用いられている<sup>1</sup>。しかし、UPy 骨格を持つ架橋剤やモノマーは種々の有機溶媒への溶解性が低いことから、UPy 骨格のポリマーへの導入効率の制御は難しい。今回、有機溶媒へ可溶な柔軟鎖を導入した新規 UPy ビニルモノマーを設計・合成し、種々のビニルモノマーとの共重合を行った (Scheme 1)。また、水素結合型ネットワークポリマーの力学特性および解架橋条件の検討を行ったので報告する。



1. K. E. Feldman, M. J. Kade, E. W. Meijer, C. J. Hawker, E. J. Kramer, *Macromolecules* 2009, **42**, 9072; C. Creton, *Macromolecules* 2017, **50**, 8297; S. V. Wanasinghe, O. J. Dodo, D. Konkolewicz, *Angew. Chem. Int. Ed.* 2022, **61**, e202206938.