



JGP Seminar

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“Smart Temperature Responsive Polymers with LCST at Fever Temperature”

Abstract: The temperature responsive materials with low critical solution temperatures (LCST) in the physiological range (30-40 °C) attract much attention due to their potential biomedical applications and drug delivery systems. Poly(N-isopropyl acrylamide) (PNIPAM) has been the most studied temperature responsive homo-polymer exhibiting LCST in water around 32 °C which is close to the lower end of the physiological range.^{1,2} The efforts have been made to tune the LCST of PNIPAM to around 37 °C by variation in hydrophilic or hydrophobic co-monomer content, for different biomedical applications.

The lecture discusses the synthesis and characterisation of potentially biocompatible and biodegradable smart polymeric materials exhibiting LCST within 38-40 °C, known as fever temperature. It will first demonstrate the synthesis of a novel temperature responsive water-soluble glycopolymer via copper wire-catalysed click-polymerisation with an LCST at 39 °C.³ The lecture will then demonstrate that the application of RAFT for the polymerisation of N-vinyl caprolactam using a range of custom synthesised RAFT agents will produce PNVCL exhibiting LCST within the range of 38-40 °C. The investigation of the cloud point of the aqueous solutions of these smart materials by optical microscopy and UV-Vis spectroscopy will also be discussed.

1. Schild, H. G., *Prog. Polym. Sci.* 1992, 17 (2), 163-249.
2. Hopkins, S.; Carter, S.; MacNeil, S.; Rimmer, S., *J. Mater. Chem.* 2007, 17 (38), 4022-4027.
3. Eissa, A.M.; Khosravi, E., *Eur. Polym. J.* 2011, 47, 61-69.

**日時: 平成27年6月26日(金) 13:00 – 14:30
場所: 桂キャンパス A2棟 303号室**

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