

GRAFT-COPOLYMERS OF N-ISOPROPYLACRYLAMIDE AND LACTIDE: SYNTHESIS AND LCST BEHAVIOUR



SYNTHESIS AND LCST BEHAVIOUR

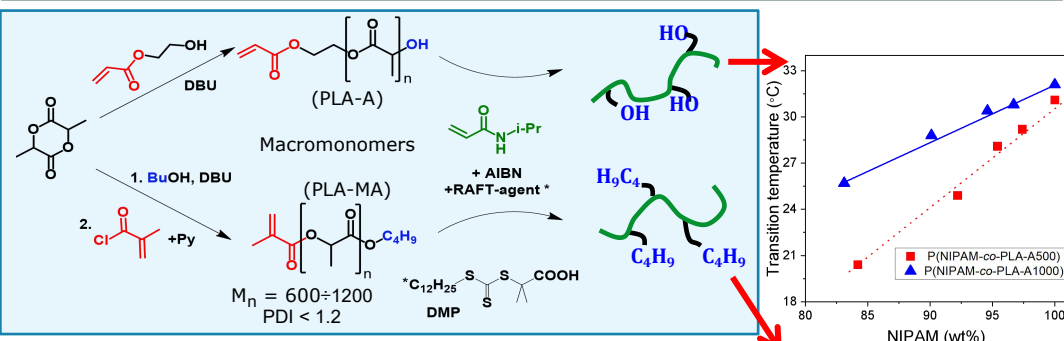


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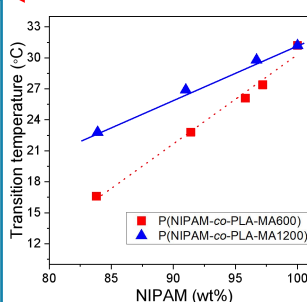
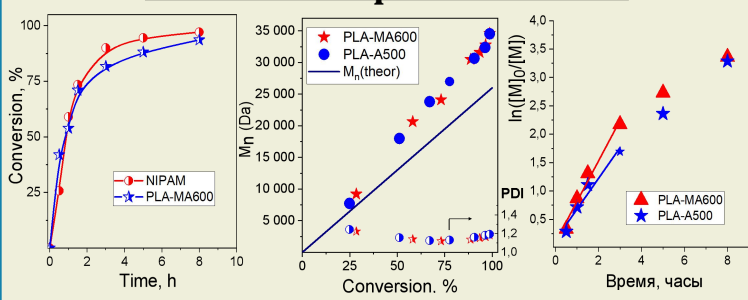
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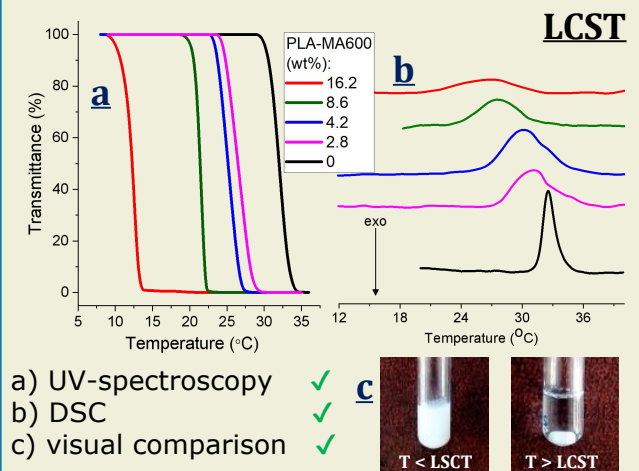
(Co)polymers of N-isopropylacrylamide (NIPAM) are known for the thermosensitivity of their solutions in water. Such (co)polymers are non-toxic, therefore they are widely examined for drug delivery. Polylactides (PLAs) are also used in pharmacy and cell cultivation. Graft-copolymers of NIPAM and polyesters should have both thermosensitivity in water solutions, partial bioresorption, better biocompatibility and affinity for cells in comparison with neat poly(NIPAM).



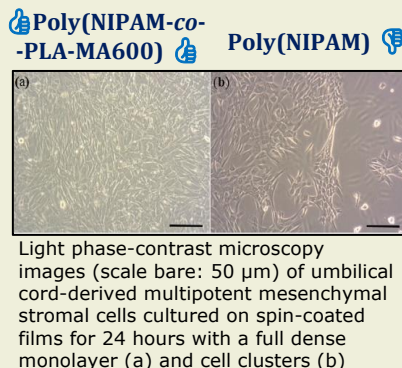
Kinetics of copolymerization



LCST



Cell proliferation test



- Well-defined copolymers via sequential ROP and RAFT-mediated copolymerization (macromonomer approach)
- Polymerization control leads to close M_n values (about 30 kDa) and low PDI ($M_w/M_n < 1.25$) for all graft-copolymers
- Mostly equal determination of LCST by three different methods
- Linear correlation between LCST and copolymer composition

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- Hydrophobic macromonomers decrease LCST
- Utilization of OH-terminated macromonomers leads to reducing the LCST value in a lesser degree (20 - 32,1 °C) in comparison with Bu-terminated ones (16,5 - 32,1 °C)
- Higher molecular weight of macromonomer leads to lesser decrease of LCST value
- Non cytotoxic according to tests under recommendations of the ISO/EN 10993 p. 5
- Better cell adhesion leads to better cell proliferation in comparison with neat poly(NIPAM)

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