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RAFT POLYMERIZATION IN INVERSE MINIEMULSION: A NEW ROUTE TO WATER-SOLUBLE POLYMERS

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Well defined water soluble polymer and latexes in submicron size have important applications in various fields such as drug delivery, industrial catalysis, and coatings. However, water soluble monomers, e.g. acrylamide, usually have a large propagating but a low termination constant. The fast polymerization rate as well as the high molecular weight of water soluble polymers would lead to the mixing and heat transfer issue in industry. It is also difficult to design the polymer structure and control the molecular weight distribution of polymers.

To overcome these problems, RAFT inverse miniemulsion polymerization is applied here as a unique approach to synthesize these hydrophilic polymer and nanosized latexes. Due to the RAFT chemistry, the polymers derived maintain their “livingness”. Well defined homopolymers and copolymers can be produced. The kinetic behaviour of inverse RAFT miniemulsion polymerization is studied. Effects of reaction parameters on the control over polymer are investigated.