Accepted Manuscript

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PII: S0001-8686(18)30166-0
DOI: doi:10.1016/j.cis.2018.08.002
Reference: CIS 1903

To appear in: *Advances in Colloid and Interface Science*

Please cite this article as: Ratchapol Jenjob, Farzad Seidi, Daniel Crespy , Recent advances in polymerizations in dispersed media. Cis (2018), doi:10.1016/j.cis.2018.08.002

Recent Advances in Polymerizations in Dispersed Media

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Abstract

Advances in chemistry heterophase polymerizations reflect new developments in polymer chemistry. Although some few polymerization reactions cannot be performed in dispersed media, new polymerization reactions can still benefit from advantages of heterophase reactions, which are fast kinetics due to high local concentration of reagents and advantageous heat exchange. We describe here advances in heterophase polymerizations, with a focus on miniemulsion polymerization, which are mainly driven by academic interest for biomedicine and energy science. Click-reactions in dispersion are particularly interesting because they are bioorthogonals. Synthesis of highly crosslinked polymer colloids, especially with conjugated polymers, has found applications in gas storage, catalysis, and production of energy. Finally, we show how spatial segregation in heterophase polymerization can help to obtain polymer materials with unique structures.

Keywords: Click chemistry, emulsion, heterophase polymerization, nanoparticle, thiol-ene reaction.