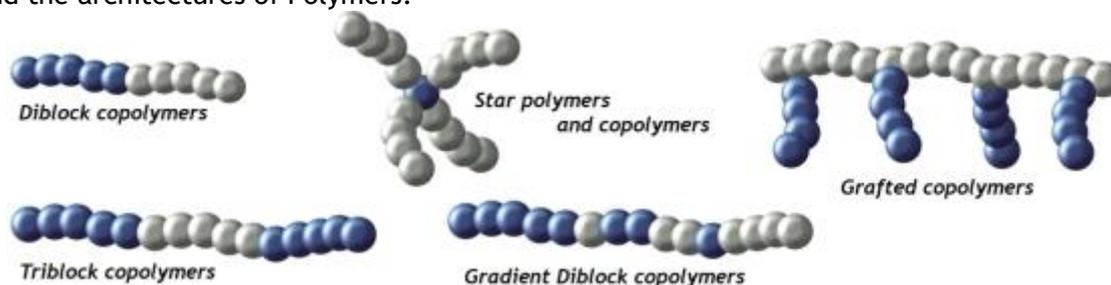


This message contains graphics. If you do not see the graphics, click [here](#) to view

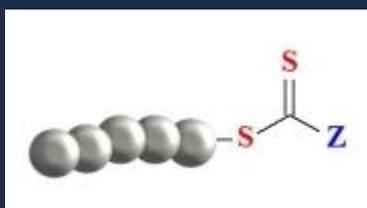


WELL DESIGNED POLYMERS *by Controlled Radical Polymerization*

Controlled Radical Polymerization (CRP) refers to a variety of Radical based Polymerization methods (RAFT, ATRP, NMP, etc...) that allow mastering the molecular weight, the dispersity and the architectures of Polymers.

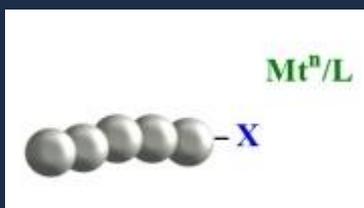


In comparison with polymers obtained by free radical polymerization, PRC do not end by irreversible termination reaction and polymer chain ends can be reactivated (reversible transfer or termination) in order to build-up well designed polymers.



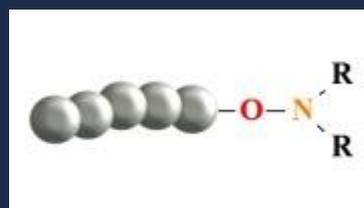
RAFT

Reversible Addition-Fragmentation chain-Transfer polymerization is based on thiocarbonylthio Chain Transfer Agents (CTA) such as diethioester or trithiocarbonates. Almost all kind of monomers (meth)acrylates, styrenic, etc.) can be polymerized by RAFT if the CTA is well chosen. RAFT polymerization at 100 grams scale can be performed at SPECIFIC POLYMERS.



ATRP

Atom Transfer Radical Polymerization is based on transition Metal/Ligand complex as catalyst and alkyl halide (R-X) as initiator. Main issue of ATRP polymerization at industrial scale is the presence of Copper in the final product. Thus, SPECIFIC POLYMERS works more on Low Cu content ATRP methods such as ARGET, ICAR or SARA ATRP.



NMP

Nitroxide-mediated radical Polymerization is a method of radical polymerization based on alkoxyamine that can create N-O nitroxide stable radicals (Persistent radical effect). TEMPO is mainly used to mediate styrenic monomers polymerization but alternative nitroxides were developed for the polymerization of other monomers.



UP-SCALED PRC POLYMERIZATION TO 100 GRAMS

The development of processes using well designed polymers obtained by PRC are often limited to low technology readiness level due to the inability of the research laboratory to produce enough matter to validate proof of concept at pilot, semi-industrial scales. SPECIFIC POLYMERS proposes to work on the **up-scaled production of your targeted well designed Polymers** in order to bring your ideas one step further. Reachable quantities depends on selected PRC method and specific precursors needed.

RELATED ARTICLES



Well-Defined Phosphonate-Functional Copolymers Through RAFT Copolymerization

I. Bliidi, et al., J Polym Sci Pol Chem 2014, 52 (18),

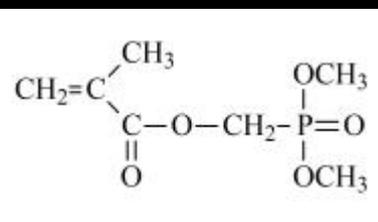


Synthesis by RAFT of innovative well-defined (co) polymers from a novel phosphorus-based acrylamide monomer

A. Graillot et al., Polym. Chem., 2013, 4, 795

FOCUS ON MAPC1 MONOMER

MAPC1 (SP-41-003) is one of the most sell and used phophonate monomer from SPECIFIC POLYMERS catalog. **Batches up 100 grams** are produced. Whatever the application, MAPC1 can be copolymerized with other monomers to reach the targeted properties. Controlled polymerization (RAFT, ATRP) of this monomer allow reaching many different architectures (statistical, diblock, triblocks, grafted, stars, etc.).



RAFT polymerization of dimethyl(methacryloyloxy)-methyl phosphonate and its phosphonic acid derivative

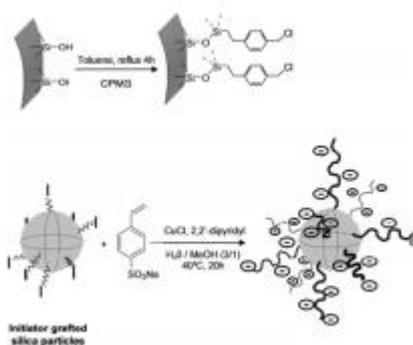
B. Canniccioni et al., Polymer Chemistry, 2013, 4, 3676



Atom transfer radical polymerization of dimethyl(methacryloyloxy)-methyl phosphonate

K. Matyjaszewski et al., European Polymer Journal 56 (2014) 11-16

SURFACE INITIATED ATRP POLYMERIZATION



SPECIFIC POLYMERS developed the synthesis and is now producing **poly(styrenesulfonate)-grafted silica particles at 200 grams scale**. The grafting density of PSSNa chains as well as their molecular weight can be tuned depending on the targeted properties. SPECIFIC POLYMERS is currently working to improve the synthesis of this particles (Lower Cu content, Non-toxic solvents)

[Marechal, M. et al., Nanoscale 2015, 7 \(7\), 3077-3087](#)

Looking for a partner that can achieve Controlled Radical Polymerization ?

Do not hesitate to contact us

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