PROGRESS IN COBALT-MEDIATED RADICAL POLYMERIZATION.

Debuigne Antoine, Hurtgen Marie, Piette Yasmine, Thomassin Jean-Michel, Jérôme Christine, Detrembleur Christophe.

Center for Education and Research on Macromolecules, University of Liege, Sart-Tilman, Bat B6A, 4000, Liege, Belgium. adebuigne@ulg.ac.be

Nowadays, controlled radical polymerization (CRP) is a technique of choice for the preparation of a wide range of novel polymer materials with well-defined molecular parameters. Metallic species have deeply marked this field of research as assessed by the development of atom transfer radical polymerization (ATRP). Besides this very successful system, another metal assisted CRP technique is emerging, i.e. organometallic-mediated radical polymerization (OMRP) (see scheme below).[1] In contrast to ATRP, OMRP involves the reversible formation of a covalent bond between a metal and the polymer chains, which strongly decreases the extent of termination reactions and leads to polymers with predictable molecular weights. Although many transition metals have shown ability to mediate the polymerization of vinyl monomers,[1] OMRP based on cobalt, namely the cobalt-mediated radical polymerization (CMRP), is the most efficient and versatile one.[2] For example, the polymerization of important monomers like vinyl acetate (VAc), *N*-vinylpyrrolidone (NVP) and acrylonitrile (AN) can be properly controlled by *bis*(acetylacetonato)cobalt(II) ($Co(acac)_2$).[2]

$$M_t^n + P^\bullet \rightleftharpoons M_t^{n+1}\text{-}P \qquad \textbf{\textit{OMRP}}$$

M_t^n = **Co**, Ti, V, Cr, Fe,...

This communication will focus on recent progress in the field of CMRP. The investigation of CMRP of other monomers like acrylates[3], vinyl chloride (VC) and isoprene[4-6] as well as functionalization of fullerenes[7] and nanotubes[8] will be presented.

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