

## Polymer Design by Cobalt-Mediated Radical Polymerization (CMRP)

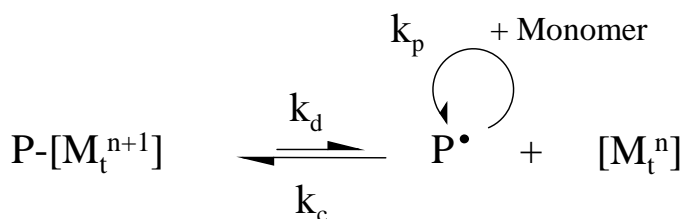
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Nowadays, the development of *controlled radical polymerization* (CRP) appears as a major achievement because it paved the way to the synthesis of unprecedented and precise macromolecular architectures. An emerging class of CRP today is *Organometallic-Mediated Radical Polymerization* (OMRP).<sup>[1]</sup> The latter is based on the reversible deactivation of the growing radical chains by a transition metal species (See scheme below). All along the polymerization, the dominating population of inactive chains is in equilibrium with a low amount of active ones, which strongly decreases the probability of irreversible termination reactions, abundant in a free radical polymerization. Some Titanium, Cobalt, Chromium and Vanadium complexes have been successfully used as regulating agents<sup>[1]</sup> and the so-called *Cobalt-Mediated Radical Polymerization* (CMRP) is the most versatile system, until now.<sup>[2-5]</sup> Mechanistic and synthetic progress of CMRP as well as remaining challenges will be presented in this communication.



- (1) M. Hurtgen, C. Detrembleur, C. Jerome and A. Debuigne, *Polymer Reviews* **2011**, 188-213.
- (2) A. Debuigne, R. Poli, C. Jerome, R. Jerome and C. Detrembleur, *Prog. Polym. Sci.* **2009**, *34*, 211-239.
- (3) A. Debuigne, J.-R. Caille and R. Jerome, *Angew. Chem., Int. Ed.* **2005**, *44*, 1101-1104.
- (4) A. Debuigne, C. Jerome and C. Detrembleur, *Angew. Chem., Int. Ed.* **2009**, *48*, 1422-1424.
- (5) A. Debuigne, R. Poli, J. De Winter, P. Laurent, P. Gerbaux, P. Dubois, J.-P. Wathélet, C. Jerome and C. Detrembleur, *Chem.-Eur. J.* **2010**, *16*, 1799-1811.