SYNTHESIS OF NOVEL BLOCK COPOLYMERS BY COBALT-MEDIATED RADICAL POLYMERIZATION (CMRP) AND ISOPRENE-ASSISTED RADICAL COUPLING REACTION (I-ARC).

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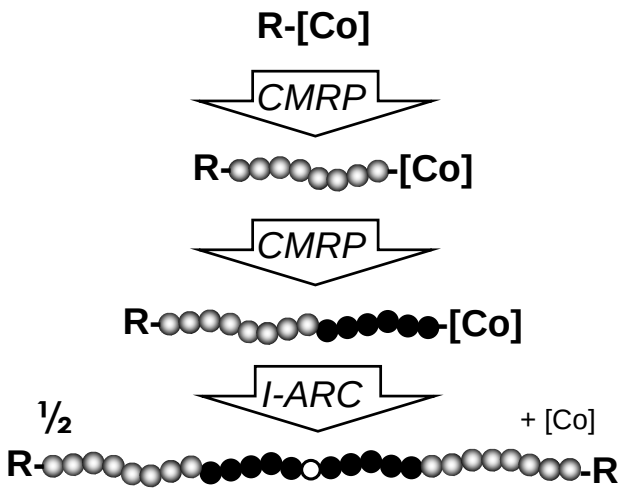
Nowadays, progresses in medicine, biotechnology, microelectronic and many other fields are more and more sustained by the development of novel polymer materials with constantly improved properties and well-defined molecular parameters. In this context, we designed an innovative and very promising tool for macromolecular engineering.[1] This technique, called ***Isoprene-Assisted Radical Coupling*** (I-ARC)[1], allows to couple quantitatively polymer chains preformed by ***Cobalt-Mediated Radical Polymerization*** (CMRP)[2], an efficient controlled radical polymerization system for vinyl acetate (VAc)[3,4] and acrylonitrile (AN)[4]. Typically, addition of isoprene to well-defined polymers prepared by CMRP invariably leads to the quantitative coupling reaction of the chains, as assessed by the perfect doubling of the molar mass of the polymer. Importantly, the I-ARC reaction is not limited to macromolecules with low molar masses and homopolymers, contrary to the previously reported radical chains coupling methods. Indeed, when applied to diblock copolymers[5], I-ARC constitutes a straightforward approach for the synthesis of telechelic symmetrical ABA triblock copolymers, as illustrated by the preparation of poly(vinyl acetate)-*b*-poly(acrylonitrile)-*b*-poly(vinyl acetate) triblock copolymers and their derivatives.



References

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