

Vinyl Acetate : A challenge for Living Radical Polymerization

In the last decades, the demand for new materials with controlled properties constantly increased. In that context, Living Radical Polymerization (LRP) was developed as a valuable strategy to design a large range of polymers with well-defined molecular characteristics (length, composition and architecture). Among those powerful macromolecular engineering methods are nitroxide mediated polymerization (NMP), atom transfer radical polymerization (ATRP) and radical addition-fragmentation chain transfer polymerization (RAFT). However, despite many advances in the field, these techniques only offer poor or moderate control of the polymerization of vinyl acetate (VAc), which is used for industrial applications. Within the search for new living radical polymerization processes, we designed a system based on cobalt complexes which is able to control efficiently the polymerization of this challenging monomer. In a macromolecular engineering effort, the Cobalt Mediated Radical Polymerization technique was used for the synthesis of well-defined polymeric materials containing poly(vinyl acetate) and poly(vinyl alcohol).