Supercritical Carbon Dioxide as Reaction Medium for Atom Transfer Radical Polymerization of Vinyl Pivalate

무하마드 나오샤드 이슬람, Van Hoa Nguyen*, 심재진
영남대학교
(hoadhnt@gmail.com*)

Supercritical carbon dioxide (scCO2) is an inexpensive and environmentally benign medium for radical polymerizations. It is the most extensively used supercritical fluid medium for controlled/living radical polymerizations, since the monomer, initiator, ligands, and control reagents (nitroxide, etc.) are soluble, but the catalyst as well as the polymer formed are insoluble beyond a critical degree of polymerization (Jcrit). In this study, atom transfer radical polymerization of vinyl pivalate employing ethyl 2-bromoisobutyrate as initiator and CuBr/terpyridine as catalyst was investigated at different reaction conditions (e.g temperature, pressure, feed ratio) in scCO2. The number average molecular weight of poly(vinyl pivalate) increased with the yield and the polydispersity was relatively narrow as the pressure has been increased as well as with the density of scCO2.