PC 08

USE OF POLY(ETHYLENE OXIDE) MACRORAFT AGENT AS A STABILIZER IN MINIEMULSION POLYMERIZATION AND ITS IMPACT ON THE STRUCTURE OF THE RESULTING PARTICLES

A.M. dos Santos[b], T. Le Bris[a], F. D'Agosto[a], M. Lansalot[a]

[a]*LCPP team-C2P2, UMR 5265 (CNRS/ESCPE/UCB Lyon 1), 43 boulevard du 11 Novembre 1918, BP 2077, 69616 Villeurbanne, France*

[b]*Laboratório de Polímeros, Departamento de Engenharia Química, Escola de Engenharia de Lorena - USP, Estrada Municipal do Campinho, s/nº, CP 116, 12.602.810, Lorena (SP), Brasil*

Poly(ethylene oxide) (PEO)-based molecules have demonstrated their unique potential for latex syntheses and are considered as an important class of stabilizers in the industry. The stabilization efficiency strongly depends on the anchorage of the PEO part on the surface of the latex particles. The anchorage strategies described in the literature include the use of thiol-ended PEO as chain transfer agent-surfactants (transurf)[1]. Thiocarbonyl thio compounds of structure R-SC(=S)-Z are much more efficient chain transfer agents than thiols. Indeed, when Z and R groups are adequately chosen, a very fast and reversible transfer can be induced. This feature is at the origin of the powerful RAFT (Reversible Addition-Fragmentation chain Transfer) polymerization technique. In this process all the polymer chains carry a thiocarbonyl thio functionality (-SC(=S)-Z) at the end of the reaction. For polymerization in dispersed media, one may take advantage of the reactivity of this chain end to produce stabilizers via the *in situ* formation of surface active block copolymers, providing new tools to design latex surfaces[2-5].

Using this concept, this paper focuses on the synthesis of polystyrene particles via miniemulsion polymerization using a PEO macroRAFT agent as both stabilizer of the particles and efficient control agent of the free radical process. In particular, the morphology of the obtained particles will be discussed.

References

(1) Vidal, F.; Guillot, J.; Guyot, A. *Polym. Adv. Technol.* **1995**, *6*, 473-479; Bourgeat-Lami, E.; Guyot, A. *Colloid Polym. Sci.* **1997**, *275*, 716-729.

(2) a) Ferguson, C.J.; Hughes, R.J.; Nguyen, D.; Pham, B.T.T.; Gilbert, R.G.; Serelis, A.K.; Such, C.H.; Hawkett, B.S. *Macromolecules* **2005**, *38*, 2191-2204. b) Ferguson, C.J.; Hughes, R.J.; Pham, B.T.T.; Hawkett, B.S.; Gilbert, R.G.; Serelis, A.K.; Such, C.H. *Macromolecules* **2002**, *35*, 9243-9245.

(3) Manguian, M.; Save, M.; Charleux, B. *Macromol. Rapid Commun.* **2006**, *27*, 399-404.

(4) Martins dos Santos, A.; Pohn, J.; Lansalot, M.; D'Agosto, F. *Macromol. Rapid Commun.* **2007**, *28*, 1325.

(5) Ji, J. ; Yan, L. ; Xie, D. *J. Polym. Sci., Part A : Polym. Chem*. **2008**, 46, 3098-3107.