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Self-organized materials and graft copolymers of polymethylmethacrylate and polyamide-6 obtained by reactive blending

M. Freluche[a], I. Iliopoulos[a,*], J.J. Flat[b], A.V. Ruzette[a], L. Leibler[a]

[a]*Soft Matter and Chemistry (ESPCI-CNRS, UMR 7167), ESPCI, 10 rue Vauquelin, 75231 Paris, Cedex 05, France*
[b]*ARKEMA, CERDATO, 27470 Serquigny, France*

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Abstract

Nanostructured blends of poly(methylmethacrylate) and polyamide-6 (PMMA/PA6) were prepared by reactive blending. The grafting reaction occurs between the amino end-group of PA6 and glutaric anhydride units randomly distributed along the backbone of PMMA. Short PA6 grafts were used to facilitate reaction at the interface. Very fine morphologies were obtained after blending. Annealing the blends above the melting point of polyamide reveals that the amount of anhydride present on PMMA chains controls self assembly of the blends and stability of the copolymer at the interface. In some cases, stable swollen lamellar assemblies were achieved. These materials exhibit interesting properties such as transparency, creep resistance and solvent resistance.

Keywords: Reactive blending; Graft copolymer; Morphological stability