

Correction to Synthesis and Remarkable Efficacy of Model Polyethylene-*graft*-poly(methyl methacrylate) Copolymers as Compatibilizers in Polyethylene/Poly(methyl methacrylate) Blends

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We recently reported¹ grafting poly(methyl methacrylate) (PMMA) from a polyethylene (PE) backbone containing α -bromoisobutyrate initiating groups by atom transfer radical polymerization (ATRP). In that work it was estimated that each PE backbone chain contained about 20 initiating sites using an ¹H NMR spectroscopy-based calculation of the mole fraction of α -bromoisobutyrate groups in an unsaturated precursor. This analysis essentially assumed that high temperature hydrogenation of the unsaturated precursor did not impact the level of α -bromoisobutyrate functionalization in the saturated PE product. Upon revisiting this assumption, however, it was recognized that while there was strong spectroscopic evidence for the presence of α -bromoisobutyrate groups along the PE chain, the actual number of these groups per chain was overestimated. Reanalysis of the high temperature functionalized PE ¹H NMR spectrum assuming exactly two end groups per chain gave only about two α -bromoisobutyrate moieties per chain. To confirm this result, elemental analysis was conducted on both the unsaturated precursor and the final hydrogenated (PE) material. In the precursor, the bromine was present at about 4 wt %, consistent with about 20 α -bromoisobutyrate groups per chain. However, after hydrogenation the product contained less than 0.25 wt % bromine by elemental analysis. Therefore, a significant fraction of the α -bromoisobutyrate functional groups were lost during the hydrogenation step. Although graft copolymers were successfully prepared using the functionalized PE, the number of branches per chain in the PE samples is approximately 2 (based on the ¹H NMR spectrum of the PE precursor). This in turn means that the PMMA grafts in the final PE-*g*-PMMA samples are actually about 10 times longer than originally estimated. As a consequence of this correction and retaining our labeling convention, PE-*g*-PMMA-6, PE-*g*-PMMA-12, and PE-*g*-PMMA-24 should be replaced by PE-*g*-PMMA-60, PE-*g*-PMMA-120, and PE-*g*-PMMA-240, respectively, throughout the paper.

The overall conclusions were largely based on comparing the relative lengths of the PMMA side chains in the set of grafted macromolecules. So, in a general sense, this correction does not significantly impact the outcome of the previous study. For example, the stated conclusion “The graft copolymer with the shortest side chains studied displayed the most promising behavior” still holds, but the graft copolymer with the shortest side chain is the one with about two 60 kg/mol PMMA grafts and not about 20 6 kg/mol grafts. However, when referring to adhesion studies, the following comment “Nevertheless, it is remarkable that such short, oligomeric side chains can have such a profound beneficial effect” should be deleted.

Note: Mohammad T. Savoji carried out experiments that identified and investigated the technical issues associated with this correction and has been included in the author list.

■ REFERENCES

- (1) Xu, Y.; Thurber, C. M.; Lodge, T. P.; Hillmyer, M. A. Synthesis and Remarkable Efficacy of Model Polyethylene-*graft*-poly(methyl methacrylate) Copolymers as Compatibilizers in Polyethylene/Poly(methyl methacrylate) Blends. *Macromolecules* **2012**, *45*, 9604–9610.

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