Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Manipulating the morphologies and lamellar orientations of substrate-supported polyester films using end-grafted poly(methacrylate) brushes[1] YA-TING HSIEH, EAMOR M. WOO, Department of Chemical Engineering, National Cheng Kung University, ATSUSHI TAKAHARA, YUJI HIGAKI, Institute for Materials Chemistry and Engineering, Kyushu University — Crystallization of polymeric materials on solid substrates has technological and scientific importance in applications such as coatings, electronic devices and solar cells. Crystalline morphologies and orientations of polymer near the polymer/substrate interface can be greatly altered by tuning the specific interactions between polymer and substrate. In this talk, we will show the effect of end-grafted poly(methacrylate) brushes in controlling the spherulitic morphologies and lamellar assembly patterns of thin polyesters films on glass substrate. Poly(methyl methacrylate) (PMMA) and poly(benzyl methacrylate) (PBzMA) brushes were grafted on glass surface using surface-initiated atom transfer radical polymerization method. The crystalline morphologies and lamellar orientations of polyesters on the brush-grafted substrate were then investigated using polarized optical microscopy (POM) and atomic force microscopy (AFM). The results clearly showed that the spherulitic morphologies of polyesters are strongly depending on interaction strength between polyesters and brushes.

[1]We acknowledge the financial support from Taiwan's National Science Council under the grant NSC-102-2221-E-006-268-MY3. We are grateful for the 2013 Summer Program provided the Interchange Association, Japan.

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Date submitted: 15 Nov 2013 Electronic form version 1.4