



SL 13.6

Monitoring Reactive Grafting Using In-line Vibrational Spectroscopy

*S.E. Barnes (a), M. Woodhead (a), E. Burton (b), H.G.M. Edwards (b), I.J. Scowen (b) and
P.D. Coates (a)*

*(a) IRC in Polymer Science and Engineering, School of Engineering, Design and Technology,
University of Bradford, Bradford, UK*

*(b) Department of Chemical and Forensic Sciences, School of Life Sciences, University of Bradford,
Bradford, UK*

The following research will demonstrate the application of in-line spectroscopic analysis for monitoring and characterisation of an industrially relevant polymer reaction. In-line Raman and near-infrared spectroscopy have been applied alongside on-line rheology measurements to monitor the grafting of maleic anhydride onto a polypropylene homopolymer during twin screw extrusion. The spectroscopic measurements provide real-time molecular specific information for assessment of degree of grafting, cross-linking and degradation. The effect of processing conditions including extruder throughput and screw speed on the extent and yield of chemical reaction have been determined.