Abstract

HB poly(arylene ether) systems were end capped with phenyl ethynyl functionalized groups via a 1 or 2 step approach. It was discovered that with a strong enough nucleophile the ether bonds of the polymers may undergo nucleophilic cleavage instead of substitution, degrading the polymer. Conditions were found under which the AB$_2$ and A$_2$ + B$_3$ poly(arylene ether phosphine oxide) and AB$_2$ poly(arylene ether sulfone) systems were successfully capped with p-bromophenol. The A$_2$ + B$_3$ poly(arylene ether phosphine oxide) system was then capped with phenyl acetylene, and it is believed this would be successful for the other two systems as well. The AB$_2$ and A$_2$ + B$_3$ poly(arylene ether phosphine oxide) systems were also end capped with 3-phenyl ethynyl phenol in the 1 step process. Thermal analysis was performed on the AB$_2$ poly(arylene ether phosphine oxide) system end capped with 3-phenyl ethynyl phenol. The DSC traces exhibited a glass transition temperature 188 °C and a curing temperature at 343°C that resulted in full curing. The TGA results indicated that the polymer is thermally stable under nitrogen with a 5 % weight loss occurring at approximately 482 °C.