Abstract

The phenylated bis(fluorobenzoyl) monomer, 2,3-diphenyl-1,4-bis(fluorobenzoyl) benzene, was prepared by four-step process involving diethyl 2,3-diphenyl-1,4-benzenedicarboxylate, 3,6-bis(hydroxymethyl)-1,2-diphenylbenzene and 2,3-diphenylterephthaldehyde. The final step was the Grignard reaction of the dialdehyde with p-bromofluorobenzene yielding a diol intermediate which was directly converted to the bis(fluorobenzoyl) monomer by a Jones oxidation. Polymerizations of the monomer with bisphenol-A, bisphenol-AF, p,p’-biphenol, hydroquinone and resorcinol were carried out in N-methyl-pyrrolidone (NMP) to provide novel, phenylated PEEKKs. The polymers exhibited $M_n$s of 8,740 g/mol, 6,660 g/mol, 8,670 g/mol, 4,820 g/mol and 5,090 g/mol, respectively, as well as $M_w$s of 20,700 g/mol, 12,600 g/mol, 19,500 g/mol, 9,270 g/mol and 7,900 g/mol, respectively, with $P_d$s of 2.4, 1.9, 2.3, 1.9 and 1.6, respectively. Thermal analysis of the polymers revealed the glass transition temperatures ($T_g$) of 185°C, 185°C, 201°C, 301°C and 336°C, respectively. Polymers with bisphenol-A and p,p'-biphenol revealed a 5% weight loss at 515°C and 535°C in nitrogen, respectively. All the polymers were highly soluble in chloroform and formed thin, transparent films which exhibited strong adhesion to glass and NaCl plates.