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论文

含联苯二氮杂萘酮结构聚芳酰胺的合成与表征

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摘要 用类双酚单体4-[4-(4-羟基苯基)苯基]-2*H*-二氮杂萘1酮(DHPZ-pP)与对氯苯腈进行亲核取代反应后碱性水解合成一种扭曲、非共平面杂环芳香二酸,4-{4-[4-(4-羧基苯氧基)苯基]苯基}-2-(4-羧基苯基)二氮杂萘-1酮(2).由二酸2和各种芳香二胺进行膦酰化缩聚反应制得了一系列的含联苯二氮杂萘酮结构聚芳酰胺,其特性粘数在0.42～0.72dL/g之间.该类聚芳酰胺均可溶解于NMP、DMAc和DMSO等极性有机溶剂中,并且可用DMAc为溶剂制成具有良好机械性能的透明聚合物薄膜,聚合物薄膜的拉伸强度为80～89MPa.该类聚芳酰胺具有优异的耐热性,玻璃化转变温度T_g在298～328℃之间,10%的热失重温度(T_d)在470℃以上.

关键词 聚芳酰胺 二氮杂萘酮 热稳定性 溶解性

分类号

SYNTHESIS AND CHARACTERIZATION OF POLY(ARYL AMIDE)S CONTAINING BIPHENYL PHTHALAZINONE MOIETIES

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Abstract A crank, non-coplanar heteroeyclie aromatic dicarboxylic acid,4-{4-[4-(4-carboxy phenoxy)phenyl] phenyl}-2-(4-carboxy phenyl) phthalazin-1-one (2),was successfully synthesized by the condensation of bisphenol-like monomer (DHPZ-pP) with *p*-ehlorobenzonitrile,followed by the alkaline hydrolysis of the intermediate dinitrile compound. A series of 4-biphenyl-4-yl-phthalazinone-based aromatic poly(aryl amide)s were prepared from the diacid 2 and various aromatic diamines by direct phosphorylation polycondensation. The intrinsic viscosities of polymers were in the range of 0.42～0.72 dL/g. Most of the poly(aryl amide)s were quite soluble in polar solvents such as *N*-methyi-2-pyrrolidone,*N*,*N*-dimethylaeetamide and *N*,*N*-dimethylsulfoxide. Some of them were even soluble in less polar solvents such as *m*-cresol and pyridine. The transparent,toush,and flexible films,east from the polymer solutions. possessed a tensile strength in the range of 80～89 MPa,an elongation at break of 6%～13%,and a tensile modulus of 1.59～1.92 GPa. The polymers possessed high thermal stability associated with glass-transition temperatures in the range of 298～328℃ and 10% weight-loss temperatures in excess of 470℃ in nitrogen.

Key words Poly（aryl amide） Phthalazinone Thermal stability Solubility

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