Vali-e-Asr University of Rafsanjan

19th Iranian Seminar on Organic Chemistry
Vali-e-Asr University of Rafsanjan, 5 -7 Sep. 2012

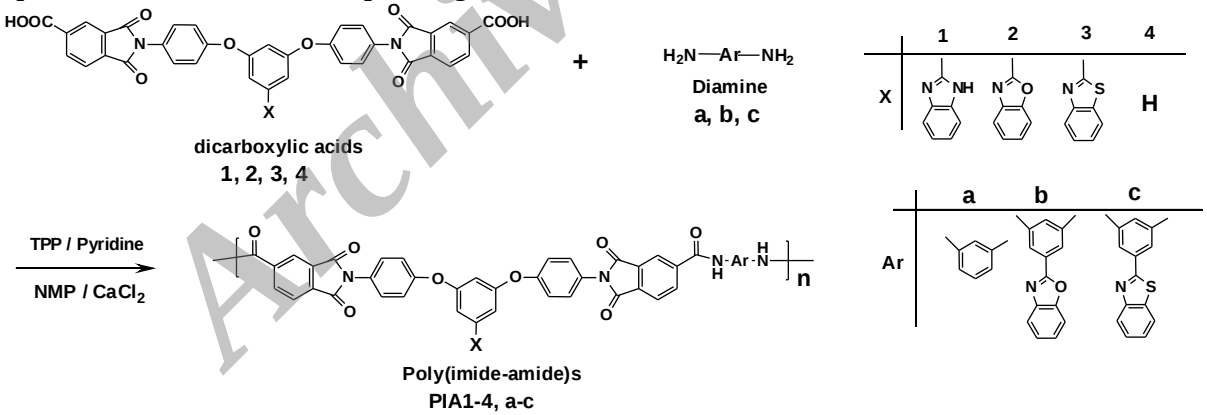
Preparation and characterization of modified poly(imide-amide)s with benzazole pendent groups and flexible ether linkages

Hojjat Toiserkani[a, b]*

[a] Department of Chemistry, College of Sciences, Hormozgan University, Bandar Abbas 3995, Iran.
[b] College of Oil Engineering, Hormozgan University, Bandar Abbas 3995, Iran.

E-mail: *Toiserkani@yahoo.com*

Polyimides have been used extensively in the aerospace and electronics fields because of their thermal stability and excellent mechanical and electrical properties [1]. Despite their widespread use, polyimides are generally intractable and lack the properties essential for successful fabrication into useful forms because of their high melting and their limited solubility in organic solvents [2]. One of the important modifications for making processable polyimides is copolymerization [3]. It has been generally recognized that flexible linkages [4] and the bulky lateral groups [5] impart better solubility and melt-processing characteristics compared with polymers without these linkages.Three series of modified poly(imide-amide)s, PIAs, were prepared from dicarboxylic acids, **1**, **2**, and **3**, with various diamines by the direct polycondensation in *N*-methyl-2-pyrrolidinone (NMP) using triphenyl phosphite and pyridine as condensing agents. The characterization of the polymers was performed with inherent viscosity measurements, solubility tests, FT-IR, and ^{1}H-NMR spectroscopy and thermogravimetry. All the polymers were obtained in quantitative yields with inherent viscosities of 0.39-0.65 dl g^{-1}. For comparative purposes, the corresponding unsubstituted PIAs were also prepared by reacting a dicarboxylic acid monomer **4** (lacking pendent group) with the same diamines under similar conditions. The solubilities of modified polymers in common organic solvents as well as their thermal stability were enhanced compared to those of the corresponding unmodified PIAs.



References

[1] M. K. Ghosh, K. L. Mittal, 'Polyimides: Fundamentals and Applications', Marcel Dekker, New York, 1996.
[2] P. M. Hergenrother, S. J. Havens, Macromolecules 1994, 27, 4659.
[3] M. Ding, Prog. Polym. Sci. 2007, 32, 623.
[4] H. Toiserkani, High Perform. Polym. 2011, 23, 542.
[5] H. Toiserkani, H. Sheibani, K. Saidi, Eur. Polym. J. 2010, 46, 185.