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Rapid Synthesis of New Poly(amide-imide)s Based on N-(4-Carboxy phenyl) trimellitimide and Hydantoin Derivatives under Microwave Irradiation

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Abstract: Six new poly (amide-imide)s (6a-f) were prepared under microwave irradiation by polycondensation reaction of diacid chloride (4) with 6 different derivatives of hydantoins (5a-f) using O-cresol as a microwave absorbent. These new PAIs were obtained in high yield and with inherent viscosities between 0.15 and 0.25 dL/g. The resulting poly(amide-imide)s were characterized by elemental analysis, viscosity measurements, thermal gravimetric analysis (TGA & DTG), solubility test, and FT-IR spectroscopy. N-(4-chlorocarbonyl phenyl) trimellitimide acid chloride (4) was prepared by a 2-step reaction. First trimellitic anhydride (1) was reacted with 4-amino benzoic acid (2) in acetic acid solution and the resulting imide-acid [N-(4-carboxy phenyl) trimellitimide] (3) was obtained in high yield. Then diacid (3) was converted to N-(4-chlorocarbonyl phenyl) trimellitimide acid chloride (4) by reaction with thionyl chloride in the presence of pyridine.

Key Words: Thermally stable polymers; icrowave irradiation; Poly (amide-imide; Hydantoin derivatives

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