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Synthesis and Properties of New Polyamides Based on 4-Phenylenediacrylic Acid and Hydantoin Derivatives in the Main Chain

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Abstract: Six new polyamides (5a-f) containing p-phenylenediacrylic and hydantoin moieties in the main chain were prepared by direct polycondensation reaction of 4-phenylenediacrylic acid (3) with 6 different hydantoin derivatives (4a-f) using thionyl chloride and pyridine as condensing agents and N-methyl-2-pyrrolidone as solvent. These new polymers (5a-f) were obtained in high yield and inherent viscosity between 0.35-0.55 dL/g. The resulting polyamides were characterized by elemental analysis, viscosity measurements, thermal gravimetric analysis (TGA and DTG), solubility test, and FT-IR and UV-vis spectroscopy. 4-Phenylenediacrylic acid (3) was prepared by the reaction of terephthal aldehyde (1) with malonic acid (2) in the presence of pyridine.

Key Words: Polyamides; 4-phenylenediacrylic acid; hydantoin derivatives

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