



Synthesis, Characterization and Thermal Properties of New Polyamides from N-(3', 5'-Diaminophenyl)-2-(Naphthalene-1''-yl) Acetamide

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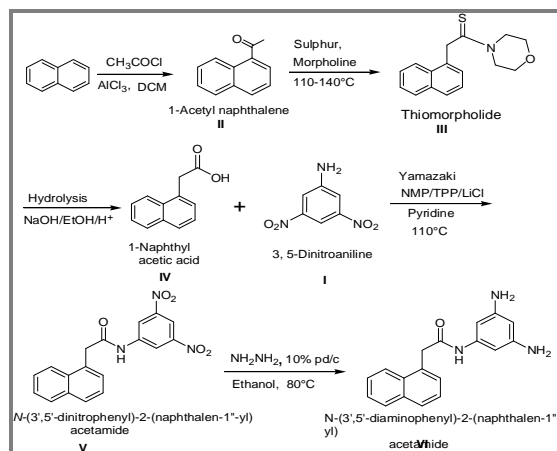
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ABSTRACT

A new diamine containing a pendant naphthalene moiety via a amide linkage; N-(3', 5'-diaminophenyl)-2-(naphthalene-1''-yl) acetamide (1-DAPNA), was prepared in four steps starting from naphthalene and characterized by spectroscopic technique. The diamine 1-DAPNA was polycondensed directly with various aromatic dicarboxylic acids to produce novel polyamides using pyridine and triphenyl phosphite as condensing agent. The resulting polyamides were characterized by inherent viscosity measurement, solubility, FT-IR, ¹H-NMR spectroscopy, thermal properties and XRD. The polyamides had inherent viscosities in the range between 0.37-0.59 dLg⁻¹ in N-methyl-2-pyrrolidone (NMP) at 30°C. All these polyamides were soluble at room temperature in polar aprotic solvents such as N-methyl-2-pyrrolidone (NMP), N, N-dimethylacetamide (DMAc), dimethylsulphoxide (DMSO), N, N-dimethylformamide (DMF), pyridine and m-cresol. Transparent and tough films of these new polyamides could be cast from NMP solution. Thermogravimetric analysis of all these polyamides showed no weight loss below 303°C with a char yield of above 20% at 900°C under nitrogen atmosphere. All polyamides are amorphous in nature and have glass transition temperatures (T_g) in the range 252-268°C.

Graphical Abstract



Synthesis of N-(3', 5'-diaminophenyl)-2-(naphthalene-1''-yl) acetamide (1-DAPNA).

Keywords: Naphthalene, Polyamides. Solubility, Amorphous, Thermal Properties.
