

ABSTRACT

The thesis presents the results on the synthesis and characterisation of a new monomer : aromatic diimidediol (II), having pendant pentadecyl substituents. The synthesis of (II) involved the reactions of 4-amino-3-pentadecylphenol (APP) derived from CNSL, with pyromellitic dianhydride (PMDA) and purified (II) was characterised by IR, H-1 and C-13 NMR spectroscopy.

The feasibility of polycondensation of (II) with aromatic diacidchloride (IPC/TPC) was studied using pyridine as acid acceptor in N-methylpyrrolidone. The nature of bulky pentadecyl substituent exerted a significant effect on solubility of resulting poly(ester-imide)s. The yield of polymers were in the range of 78-84% and inherent viscosity of 0.10 to 0.13 dL/g in NMP.

The polymer structure was established by IR spectroscopy. This $\frac{e}{nw}$ class of polymers with ordered sequence of both imide and ester groups and pendant alkyl groups was soluble in aprotic polar amide type solvents (NMP, DMAC, DMF), THF and in hot acetone and hot chlorinated hydrocarbons (chloroform, tetrachloroethane) etc. Polymers did not dissolve in methanol. The solubility of these ordered sequenced poly(ester-imide)s has been explained on steric effects of very bulky pentadecyl substituents disrupting the polymer's close packing and favoring amorphous structures.