Title : PHOSPHORUS CONTAINING POLYMERS

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ABSTRACT

The present thesis studies the synthesis of polyazomethinephosphonates, polyimidephosphonates, polyimidephosphoanhydrides and polyazoxyphosphonate by the interfacial polycondensation method. The polymerization involves the polycondensation between appropriate bishydroxy terminated or biscarboxy terminated compounds containing azomethine, imide and azoxy groups with dichlorophenyl phosphine oxide. The XPS (ESCA) peak area measurement technique has been developed as an instrumental method of elemental analysis. These polymers have been characterized by IR, ^{1}H-NMR, ^{31}P-NMR, viscosity measurements and XRD studies. The thermal and flame retardancy behavior of these polymers have been studied by TGA,DTA, TMA and LOI analysis. Incorporation of phosphorus to the extent of 8% or lower to the polymer chain results in

significant improvement of LOI values and char residues at 600°C. Thus the polymers appear to be promising in the flame-retardant applications.

Key words : Polyazomethinephosphonates; polyimidephosphonates; polyimidephosphoanhydrides; polyazoxyphosphonates; LOI value, Char residue, ^{31}P-NMR; ESCA