

(ii) Those few studies using different dopant ions which have been carried out, suggest that environmental stability and processibility might be significantly improved by, for example, the use of polymeric dopant anions with little accompanying loss in bulk conductivity.

Research Proposed

(i) Studies should be carried out on the protonic acid doping (using non-oxidizing protonic acids) of the title compounds and their derivatives, especially the polyaniline class of compounds and other N-containing polymers. The formation of ammonium-type salts, which are known to have good environmental stability in general, as distinct from carbonium-type ions which are usually highly reactive, might be expected to result in increased environmental stability of conducting polymers.

(ii) Synthesis and study of conducting polymers having oligomeric and polymeric dopant ions. Polymers incorporating monomeric ions bearing a charge greater than one (the only type of monomeric ion so far investigated) should be prepared. Such ions may lead to increased inter-chain interactions with marked changes in conductivity and related properties.

1.3 Degradation Mechanism of the Doped Polymer

Scope

This research is concerned with ascertaining the mechanism by which a polymer in its doped or non-doped form degrades thermally, photochemically, oxidatively, hydrolytically or in some specific chemical or electrochemical process, e.g. as when used as an electroactive electrode in rechargeable batteries.

Justification

Essentially all attempts to stabilize conducting polymers to date have been made using a trial and error, "hit or miss", Edisonian approach. In order to synthesize conducting polymers which are stable under some given set of experimental conditions, in a rational manner, it is first necessary