ADDENDUM

(As suggested by the Examiner in this report, Chapter I)

CHAPTER - I

Introduction: Polyanilene - The oldest conducting polymer

Though polyanilene which have been commercially exploited and form a unique class of polymer but have been left out due to its conjugated nature. Our aim was to establish that polymers having non-conjugated backbone can also be conducting under suitable doped conditions. The mechanism of conduction was different in this system as compared to conventional conjugated systems. Still we are including a literature survey of polyanilene, as it is one of the oldest & widely studied conducting polymer.

Polyanilene (PANI) is different from other conducting polymers since its doping represents acid base interaction [1]. It is known that with the increase of acidity i.e. with increased degree of protonation, the electrical conductivity of the polymer grows 8 to 10 orders in magnitude [2,3]. This makes PANI a very interesting member of the family of conducting polymers and opens up some specific possibilities of its application. PANI has been conventionally synthesized chemically or electrochemically [4,5] the electro-chemical synthesis being more convenient in a sense that the polymerization reaction, which includes the oxidation of monomer, is governed by the applied electrode potential and counter ions are supplied by the supporting electrolyte present in the solution. It is known that conducting polymers are anisotropic...
electric conductor [6] which attain metal like conductivity due to charge transport along the polymer chain (\(\sigma\), intrinsic mechanism) and a conductivity (lower in order of magnitude) perpendicular to the chain (\(\sigma_\perp\)), due to charge transport across neighbouring chain and/or fibres (hopping mechanism). A bulk conductivity of the polymer sample will result from a superposition of the various local mechanisms of charge transfer and therefore one may write [7]

\[
\sigma_{\text{bulk}} = \sigma_{\parallel} + \sigma_{\perp}
\]

Since polyaniline have a conjugated structure it will show a high level of parallel conductivity compared to systems having \(\sigma_{\perp}\) which is dependent on hopping mode of conduction.
Reference