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The Effect of the Solvents on Electrical Properties of POT Conducting Polymer

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KEYWORDS

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ABSTRACT

In this research, the preparation conducting polymer poly(O-Toluidine) emeraldine salt (ES) doped with HCL (POT/HCL) by oxidizing polymerization external doping by DBSA the effect of the solvent on the electrical characterization of Poly (O-toluidine) was studied.POT (EB) powder was completely dissolving in all solvents such as chloroform, formic acid, Toluene, and meta-cresol. The morphology and composition of POT were measured by SEM and EDX. Two-probe techniques were used to calculate electrical conductivity; an interdigitated finger electrode was used to measure electrical conductivity. The effect of temperatures on electrical conductivity was also studied to provide heating in the range of (303-373 K) and used to the found activation energy of (POT) in a different solvent.

1. Introduction

Polyaniline (PANI) and Poly (O-Toluidine) (POT) are known to be more effective polymer conductor. The area of conducting polymer has been booming quickly, day by day, and all of these products are essential for this century. Polyaniline, one of the two naturally best polymer conductors A sluggish and low processability due to its insolubility Organic special solvents [1, 2]. Polymers of the substitution aniline show greater solubility, than the conductivity found is noticeably smaller. Nonetheless, In the past few years, attempts are being made to enhance the processability of these polymers. Utilizing the Protonic acid functionality also permits the conduct of polyaniline. The production probably results in soluble polyaniline compound organic solvents such as Chloroform Formic-acid Toluene and Meta-cresol [3,4]. Once adding formic-acid the energy level would be present will be between the valence band and the conduction band and increase the energy level with increased doping (formic acid), which produces polaron bands within the energy gap naturally special bonding structure around the conjugated polymer, consists of the double alternate structure (π) and single (π) bonds (Conjugated polymers).

Suppose an electron is adjusted to the conjugated polymer column (reduction, n-type doping) or removed from it (oxidation, p-type doping). In that case, the chemical or electrochemical doping procedure has followed the charge can freely move the conjugation routes anyway when the electrical potential is applied.

The electrical conductivity of the entire dielectric (10-7S/cm) semiconductor (10-5-10-1S/cm)-metal (102-105 S/cm) scope is based on the degree of doping [5]. The oxidized state-related charge is usually delocalized over many units of such polymers and can create either a radical cation (polaron) or a dication (Bipolaron); adding charge to the chain may change the aromatic arrangement into a lower bandgap of the quinoid arrangement [6].

Activation energy is suitable for several other time scales, chemical reaction rate constants, and intrinsic disputes. It could be necessary to pick a sufficient temperature range especially dominant in these cases. Coefficients of diffusion, Period of reorientation, viscosity, and dielectric relaxation. There are only a few kinds of time scales that may be represented the Arrhenius equation is similar to Equation (4) [7].

Strong Conjugate polymer string, unique doping and de-doping cycle, and redox electrical reversibility contribute to the special properties of conductive polymers, such as strong non-linear

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