

# **Conducting Polymers -**

## **Transport Phenomena**

*Edited by*

**J. Przyluski and S. Roth**

**TRANS TECH PUBLICATIONS**  
**Switzerland - Germany - UK - USA**

## TABLE OF CONTENTS

### CHAPTER 1: ELECTRONIC CONDUCTING POLYMERS

#### Influence of molecular structure and morphology on the transport properties of polyacetylene studied by ESR

A. Bartl 1

#### Conductivity and thermopower of doped polyacetylene and polyaniline

A.B. Kaiser 13

#### Optical spectroscopy of conducting polymers: experimental methods

S. Lefrant, J. Bullet 25

#### Soliton charge storage in doped $\beta$ -carotene: consistency of optical absorption and ESR measurements with calculations of the molecular and electronic structure

J. Cornil, E. Ehrenfreund, D. Moses, A.J. Heeger, J.L. Bredas 41

#### Electrochemical synthesis and properties of polyaniline/poly(2-acrylamido-2-methyl-1-propane-sulfonic acid) (PANI/PAMPS) molecular composite

M. Lapkowski 51

#### Catalytic decomposition of isopropanol over polyaniline doped by heteropolyanions

W. Turek, M. Lapkowski, G. Bidan 65

#### In situ ESR measurements on conducting polymers.

#### Temperature and doping dependence of the spin susceptibility in the case of polyaniline

F. Genoud, M. Nechtschein, C. Santier 77

#### Conductivity studies on polypyrrole films electrochemically prepared at high dopant concentrations

R. Turcu, C. Neamtu, M. Brie 83

#### Temperature relaxation of DC conductivity of doped polypyrrole

V. Skakalova, P. Fedorko, J. Plocharski, M. Omastova 93

**Pressure relaxation of the DC conductivity and optical absorption spectra in doped polypyrrole**

P. Fedorko, V. Skakalova, K. Fröhlich, O. Foltin, J. Annus

**Transport and structural properties of pure and doped poly(3-alkylthiophenes)**

W. Luzny, P. Barta, S. Niziol, M. Zagorska

**NMR investigation of structural defects in the conductive polymer poly(3-alkylthiophene)**

P.C. Stein, A. Bolognesi, Z. Geng

**Effects of metal cations on conjugated poly(3-alkylthiophene)s**

D. Budd, P.J.S. Foot, R. Davis

## **CHAPTER 2: IONIC CONDUCTING POLYMERS**

**Polymeric electrolytes - old problems and new approaches**

J. Przyluski, W. Wieczorek, Z. Florjanczyk

**Polymer electrolyte based lithium batteries**

F. Krok

## **CHAPTER 3: COMPOSITES - BLENDS**

**Irradiation effects on AC conductivity of organic composites**

J. Ulanski, X.L. Xu, G. Boiteux, J. Davenas

**Influence of the doping anion concentration and conditions of synthesis on electrochemical properties of polyaniline**

K. Koziel

**Solubilisation and plastification of polyaniline in the protonated state**

J. Laska, M. Trznadel, A. Pron

**Conducting polymers formed from monomer intercalates**

P.G. Hill, P.J.S. Foot, D. Budd, R. Davis

**Formation and properties of polyiodide crystalline networks in conductive polymer composites**

J.K. Jeszka

**Influence of pyridinium chlorochromate on the properties of  
electrochemically and chemically synthesised polypyrrole**

M. Omastova, S. Kosina, M. Lazar, M. Kacurakova, J. Annus, J. Kristin

205

**Description of AC response of blend-based polymer electrolytes**

M. Siekierski, W. Wieczorek

215

**CHAPTER 4: APPLICATIONS AND METHODS**

**Industrial applications of conducting polymers**

W. Graupner, S. Roth

229

**Polypyrrole membranes as potentiometric sensor**

A. Hulanicki, A. Michalska

237

**Preparation of thin polyaniline films and their behaviour during  
electrochemical conversion**

B.K. Grodzicka, K. Brudzewski

245

**Introduction into experimental methods of charge transport investigations**

W. Pukacki

255