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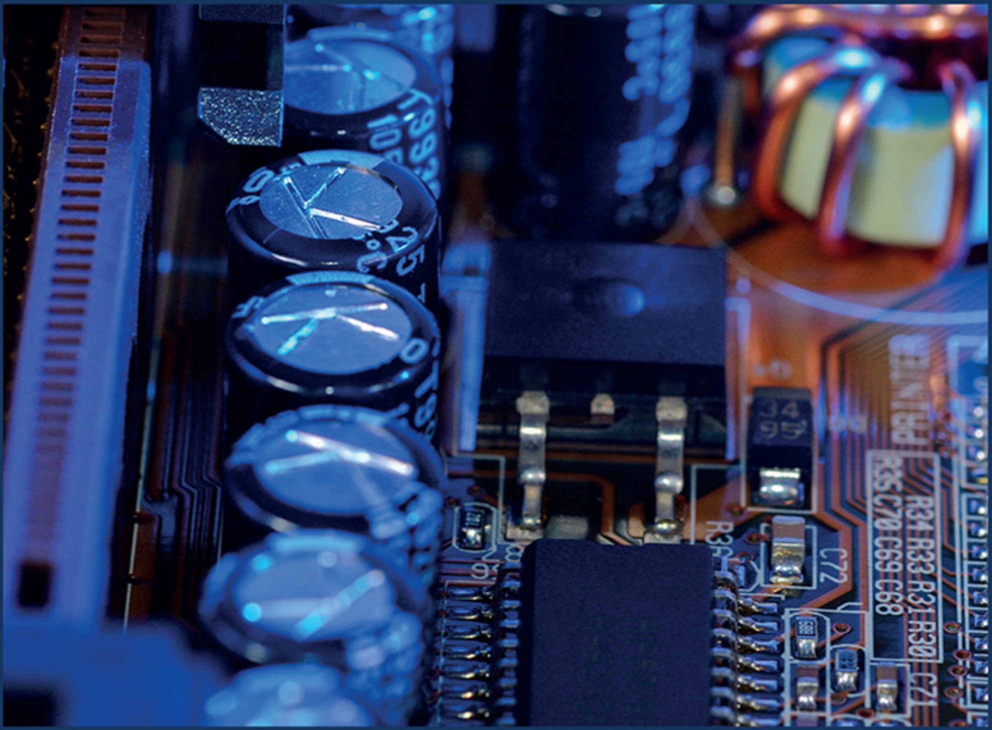

CONJUGATED POLYMERS FOR NEXT-GENERATION APPLICATIONS

SYNTHESIS, PROPERTIES AND OPTOELECTROCHEMICAL DEVICES

VOLUME 1

Edited by
VIJAY KUMAR, KASHMA SHARMA,
RAKESH SEHGAL, SUSHEEL KALIA

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Contents

14 Conductive polymer-based composite photocatalysts for environment and energy applications

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14.1 Introduction

Environmental pollution and deficiency of energy are two major problems faced by all the countries of the world. Overpopulation, industrialization, agricultural practices, and urbanization have led to various types of environmental pollutions such as air, water, and soil pollution [1,2]. Water is a significant natural resource and vital thing on earth for the survival of mankind. But human beings contaminate it by numerous activities such as household products, industrial wastage, medical waste, municipals, etc. Various types of contaminants viz. synthetic dyes, heavy metal ions, and different organic and inorganic substances cause water pollution [3−7]. The usage of contaminated water causes a wide range of harmful, poisonous, mutagenic, and carcinogenic effects [8,9]. Hence, to minimize the health hazards and to save the environment, the purification of wastewater is of major concern, and many water treatment techniques such as ion exchange [10], membrane filtration [11], chemical precipitation [12], advanced oxidation process [13], and electrochemical degradation [14,15] are available in the literature. Photocatalyst has a unique part and it can be employed as an encouraging candidate for wastewater purification applications [16].

Electricity production is not enough to make both ends meet of global energy demand in the present decades [17]. The 85% of energy originates by burning of fossil fuels such as coal, natural gas, and oil which lead to the emission of CO_2 greenhouse gases [18,19]. To reduce carbon emissions renewable energies will be a more reasonable option in the future. Even many countries have begun to install

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