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2.3.3 Kinetics and Mechanism of Electron Transfer in RCPB; 2.3.4 Electron Transfer and Molecular Dynamics in RCPB; 2.4 Reaction Centers of Photosystems I and II; 2.4.1 Reaction Centers of PS I; 2.4.2 Reaction Center of Photosystem II; 2.5 Water Oxidation System; References; 3 Photochemical Systems of the Light Energy Conversion; 3.1 Introduction; 3.2 Charge Separation in Donor-Acceptor Pairs; 3.2.1 Introduction; 3.2.2 Cyclic Tetrapyrroles; 3.2.3 Miscellaneous Donor-Acceptor Systems; 3.2.4 Photophysical and Photochemical Processes in Dual Fluorophore-Nitroxide Molecules (FNO); 3.2.4.1 System 1 3.2.4.2 Systems 23.3 Electron Flow through Proteins; 3.3.1 Factors Affecting Light Energy Conversion in Dual Fluorophore-Nitroxide Molecules in a Protein; 3.3.2 Photoinduced Interlayer Electron Transfer in Lipid Films; References; 4 Redox Processes on Surface of Semiconductors and Metals; 4.1 Redox Processes on Semiconductors; 4.1.1 Introduction; 4.1.2 Interfacial Electron Transfer Dynamics in Sensitized TiO₂; 4.1.3 Electron Transfer in Miscellaneous Semiconductors; 4.1.3.1 Single-Molecule Interfacial Electron Transfer in Donor-Bridge-Nanoparticle Acceptor Complexes 4.1.4 Redox Processes on Carbon Materials4.2 Redox Processes on Metal Surfaces; 4.3 Electron Transfer in Miscellaneous Systems; References; 5 Dye-Sensitized Solar Cells I; 5.1 General Information on Solar Cells; 5.2 Dye-Sensitized Solar Cells; 5.2.1 General; 5.2.2 Primary Gratzel DSSC; 5.3 DSSC Components; 5.3.1 Sensitizers; 5.3.1.1 Ruthenium Complexes; 5.3.1.2 Metalloporphyrins; 5.3.1.3 Organic Dyes; 5.3.1.4 Semiconductor Sensitizes; 5.3.2 Photoanode; 5.3.3 Injection and Recombination; 5.3.4 Charge Carrier Systems; 5.3.5 Cathode; 5.3.6 Solid-State DSSC; References 6 Dye-Sensitized Solar Cells II

Sommario/riassunto

Finally filling a gap in the literature for a text that also adopts the chemist's view of this hot topic, Prof Likhtenshtein, an experienced author and internationally renowned scientist, considers different physical and engineering aspects in solar energy conversion. From theory to real-life systems, he shows exactly which chemical reactions take place when converting light energy, providing an overview of the chemical perspective from fundamentals to molecular harvesting systems and solar cells. This essential guide will thus help researchers in academia and industry better understand