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Nota di contenuto	Advances in Electrochemical Science and Engineering; Contents; Preface; List of Contributors; 1: Applications of Electrochemistry in the Fabrication and Characterization of Thin-Film Solar Cells; 1.1 Introduction; 1.2 Electrochemical Routes to Thin-Film Solar Cells; 1.2.1 Basic Cell Configurations; 1.2.2 Material Requirements for PV Applications; 1.2.2.1 Implications of Materials Requirements for the Direct Synthesis of Absorber Layers by Electrodeposition; 1.2.2.2 Synthetic Routes Involving Deposition and Annealing (EDA); 1.2.2.3 Summary of EDA Routes 1.2.3 EDA route to p-Type Semiconductors for Thin-Film Photovoltaics 1.2.3.1 Electrodeposition of CdTe for CdS CdTe Solar Cells; 1.2.3.2 Electrodeposition of CIGS for CIGS CdS ZnO Solar Cells; 1.2.3.3 CZTS; 1.2.4 Future; 1.3 Characterization of Solar Cell Materials using Electrolyte Contacts; 1.3.1 Overview; 1.3.2 The Semiconductor-Electrolyte Junction; 1.3.3 Photovoltammetry; 1.3.4 External Quantum Efficiency (EQE) Spectra; 1.3.5 Electrolyte Electroreflectance/Absorbance: EER/EEA; 1.4 Conclusions; Acknowledgments; References

2: Tailoring of Interfaces for the Photoelectrochemical Conversion of Solar Energy
2.1 Introduction; 2.2 Operation Principles of Photoelectrochemical Devices; 2.2.1 Currents, Excess Carrier Profiles, and Quasi-Fermi Levels; 2.2.1.1 Dark Current and Photocurrent; 2.2.1.2 Excess Minority Carrier Profiles; 2.2.1.3 Quasi-Fermi Levels; 2.2.2 Photovoltages and Stability Criteria; 2.2.3 Photovoltaic and Photoelectrocatalytic Mode of Operation; 2.2.3.1 Photovoltaic Photoelectrochemical Solar Cells; 2.2.3.2 Photoelectrocatalytic Systems
2.2.4 Separation of Charge Transfer and Surface Recombination Rate
2.3 Surface and Interface Analysis Methods; 2.3.1 In Situ Methods: I. Brewster Angle Analysis; 2.3.2 In Situ Methods: II. Stationary Microwave Reflectivity; 2.3.3 X-ray Emission and (Photo)Electron Spectroscopies; 2.3.3.1 Selected X-ray Surface/Interface Analysis Methods; 2.3.3.2 In-System Synchrotron Radiation Photoelectron Spectroscopy; 2.3.3.3 High-Resolution Electron Energy Loss Spectroscopy; 2.3.4 Tapping-Mode AFM and Scanning Tunneling Spectroscopy; 2.3.4.1 Tapping-Mode AFM; 2.3.4.2 Scanning Tunneling Spectroscopy
2.6 Photoelectrocatalytic Devices

Sommario/riassunto

An international group of leading scientists from the field has contributed to the 12th volume in this series, covering a range of different types of solar cells and including a critical comparison of the different techniques available for manufacturing the semiconductors needed. The result is an expert insight the central questions surrounding photovoltaic materials and systems, reflecting the latest developments in this hot and timely green topic.
