Record Nr. UNINA9910132308603321 Copper zinc tin sulphide-based thin film solar cells / / edited by Titolo Kentaro Ito Pubbl/distr/stampa Chichester, England:,: Wiley,, 2015 ©2015 **ISBN** 1-118-43786-1 1-118-43785-3 1-118-43784-5 Descrizione fisica 1 online resource (452 p.) 621.31/244 Disciplina Photovoltaic cells - Materials Soggetti Solar cells - Materials Copper-zinc alloys Thin film devices Lingua di pubblicazione Inglese **Formato** Materiale a stampa Monografia Livello bibliografico Note generali Description based upon print version of record. Nota di bibliografia Includes bibliographical references at the end of each chapters and index. Nota di contenuto Title Page; Copyright Page; Contents; Preface; List of Contributors; Part I Introduction; Chapter 1 An Overview of CZTS-Based Thin-Film Solar Cells; 1.1 Introduction; 1.2 The Photovoltaic Effect; 1.3 In Pursuit of an Optimal Semiconductor for Photovoltaics; 1.4 Conclusions; Acknowledgements; References; Chapter 2 Market Challenges for CZTS-Based Thin-Film Solar Cells; 2.1 Introduction; 2.2 Compound Thin-Film Technologies and Manufacturing; 2.3 Challenges for CZTS Solar Cells in the Market; 2.4 Conclusion; References; Part II The Physics and Chemistry of Quaternary Chalcogenide Semiconductors Chapter 3 Crystallographic Aspects of Cu2ZnSnS4 (CZTS)3.1 Introduction: What Defines a Crystal Structure?; 3.2 The Crystal Structure of CZTS; 3.3 Point Defects in CZTS and the Role of Stoichiometry; 3.4 Differentiation between Intergrown Kesterite- and Stannite-Type Phases: A Simulational Approach; 3.5 Summary; References; Chapter 4 Electronic Structure and Optical Properties from

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## Sommario/riassunto

Beginning with an overview and historical background of Copper Zinc Tin Sulphide (CZTS) technology, subsequent chapters cover properties of CZTS thin films, different preparation methods of CZTS thin films, a comparative study of CZTS and CIGS solar cell, computational approach, and future applications of CZTS thin film solar modules to both ground-mount and rooftop installation. The semiconducting compound (CZTS) is made up earth-abundant, low-cost and non-toxic elements, which make it an ideal candidate to replace Cu(In,Ga)Se2 (CIGS) and CdTe solar cells which face material scarcity and toxic