1. Record Nr. UNINA9910822574803321 Autore Fahrner W. R (Wolfgang R.) Titolo Semiconductor thermoelectric generators / / Wolfgang R. Fahrner and Stefan Schwertheim [Zurich]:,: Trans Tech Publications,, [2009] Pubbl/distr/stampa **ISBN** 3-03813-321-3 Descrizione fisica 1 online resource (139 p.) Collana Materials science foundations; volume 61 Disciplina 621.31243 Soggetti Thermoelectric generators Semiconductors Lingua di pubblicazione Inglese **Formato** Materiale a stampa Livello bibliografico Monografia Note generali Description based upon print version of record. Includes bibliographical references. Nota di bibliografia Semiconductor Thermoelectric Generators; Preface; Contents; Table of Nota di contenuto Contents; 1 Introduction; 2 Historical Background; 2.1 The discovery of the thermoelectric effect by Thomas Johann Seebeck; 2.2 Historical development of the thermogenerator: 3 Basic Principles: 3.1 The Seebeck effect; 3.2 Characterization of thermoelectric generators; 4 Materials and Technology of Thermogenerators; 4.1 Thermogenerators as produced with thin film technology; 4.2 Thermogenerators as produced with thick film technology; 5 Measurement Techniques; 5.1 Measurement of the Seebeck coefficient 5.2 Measurement of the Thermal Conductivity 5.3 Four Point Measurement of the Electric Conductivity; 6 Cascadation and Segmentation; 6.1 Temperature Dependency of the Figure of Merit; 6.2 Segmented and cascaded thermogenerators; 7 New Concepts; 7.1 Nanomaterials; 7.2 Industrial concepts; 8 Condensed Literature Research; 8.1 Micro / nanothermogenerators; 8.2 Superlattice thin film thermogenerators; 8.3 Thermogenerator of layers deposited by electroplating; 9 Condensed Patent Research; 9.1 Thin film thermogenerators; 9.2 Thick film thermogenerators 10 Future Perspectives, Applications and Markets for Thermoelectrics

10.1 Future perspectives of thermoelectrics; 10.2 The patent situation

Acknowledgments: 13 List of Acronyms, Abbreviations and Symbols:

of thermoelectrics; 10.3 Applications of Thermoelectrics; 10.4 Companies and markets for thermoelectrics; 11 Literature; 12

Physical Symbols; Relevant Chemical Symbols

Sommario/riassunto

It is well-known that fossil fuels are being rapidly depleted, and that atomic power is rejected by many people. As a consequence, there is a strong trend towards alternative sources such as wind, photovoltaics, solar heat and biomass. Strangely enough, quite another power source is generally neglected: namely, the thermoelectric generator (a device which converts heat, i.e. thermal energy, directly into electrical energy). The reason for this neglect is probably the low conversion efficiency, which is of the order of a few percent at most. However, there are two arguments in favor of the