

ABSTRACT

The doctoral thesis entitled "CONTRIBUTIONS CONCERNING THE ESTABLISHMENT OF different SiC TYPES FOR THE PRODUCTION OF SOLAR CELLS WITH SUPERIOR TECHNICAL CHARACTERISTICS" is structured in 8 chapters, with the following aspects:

- In Chapter 1 entitled "PHYSICS OF SOLAR SPECTRUM AND SOLAR RADIATION FACTORS" ,studies the factors that influence the efficiency of the conversion of solar energy in electric energy as well as the basics used in this process were analyzed.

- In Chapter 2 it was studied the Romania's solar energy potential as well as its characteristic elements, which result in the efficient use of photovoltaic cells for the purpose of producing electricity.

- In Chapter 3 entitled "GENERAL CONSIDERATIONS ON SOLAR CELL SYSTEMS", the evolution of solar cells was studied, their classification made according to the technology of their production and the yields obtained.

- In Chapter 4 "EQUIVALENT CONNECTION SCHEMES AND THE RANGE OF SOLAR CELLS" the theoretical aspects of solar cell functioning were analyzed in order to identify ways to improve their functional characteristics.

- In Chapter 5 entitled "SILICONE-BASED SOLAR CELLS TECHNOLOGY", it has been predominantly analyzed and proposed a new technology for manufacturing silicon-based cells which consisting of a supplementary layer of silicon carbide in order to improve their functional characteristics under the action of ultraviolet radiation and the delay of the phenomenon of aging caused by these and the operation of the cells at high temperatures.

- In Chapter 6, RESEARCH ON DEVELOPMENT OF SIC POLITYPES FOR SOLAR CELLS WITH HIGHER TECHNICAL CHARACTERISTICS, various silicon carbide politypesd used in the construction of solar cells have been analyzed to find a transparent structure that allows light to penetrate into the solar cell, but filters ultraviolet radiation. At the same time this carbide layer protects the solar cell from overheating it.

- In Chapter 7 entitled "EXPERIMENTAL ANALYSIS ON THE STATE OF THE SOLAR CELL SURFACES AND THEIR behavior IN INFRARED FIELD, experiments were carried out regarding the structure and condition of the surface of the solar cells as well as their behavior during the propagation of the thermal fields.

- In Chapter 8, entitled MODELING AND SIMULATION OF THE PROPAGATION OF THE THERMAL FIELD IN A SOLAR CELL, a mathematical model was made by using the theory of the finite elements to simulate the solar cell behavior in the thermal field and then an analyze was performed on a solar cell built with an additional layer of silicon carbide. This determined the lower thermal field in the optimized solar cell and calculated the temperature at its base. The heat flow transmitted through each layer was calculates and presented.