

The Influence of Various Biological and Chemical Properties on the Efficiency of Nanocrystalline Solar Cells

Skierska, Anna (School: II Liceum Ogólnokształcące im. Mieszka I w Szczecinie)

Purpose A big problem of the present times is high concentration of carbon dioxide, constantly increasing global warming , as well as other phenomena, which are largely the result of obtaining energy from non-renewable energy sources. Being aware of this situation, I decided to research what factors affect the efficiency of the nanocrystalline solar cell, and to find the most effective configuration of solar cell. **Procedure** Research consists in building nanocrystalline solar cells in various configurations, then their work was checked in various conditions (for example lighting) and stability. Current-voltage characteristics was also performed, so as to ultimately select the solar cell that will display the highest efficiency. The spectrophotometric measurements in the 190-1100 nm range was conducted to check the UV-VIS areas absorbed by the solutions (organic dye) used. **Results** The work of the cell is influenced by many factors such as the materials used for its construction, the conditions under which the solar cell works and the atomic structure of the organic dyes, which are one of the most important elements in nanocrystalline solar cells. **Conclusion** This study showed that by changing the materials from which the cell is made (base surface, dye as well as electrolyte) we are able to significantly increase its efficiency and reduce the price of the solar panel.

Awards Won:

Fourth Award of \$500