

POSTER SUMMARY

NOVEL NANO-STRUCTURED, SILICON-DOPED THIN FILMS BY E-BEAM PVD FOR SOLAR ENERGY MATERIALS

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Abstract

The utilisation and depletion of fossil fuels, global warming, the ever-increasing population, as well as industrial advancements, all encourage the world to find alternative sources of energy. Solar technology has the potential to be an ideal alternative, compared to other renewable energy sources, given the geographical location of the current study. The materials prepared in the study, and their subsequent transformation to silicon derived from sugarcane bagasse, were used to fabricate a solar cell in this study. The fabrication and testing of solar cell devices have resulted in a worldwide desire by scientists to improve and reduce the cost of the materials that already dominate the photovoltaic market. This project reports on the development of photovoltaic cell and evaluates their optical and electrical properties, as well as the efficacy of a cell. The device was fabricated by using ITO glass substrates with silicon, bismuth, boron and silver as the rear contacts. The silicon is doped with boron and phosphorous to improve its electrical properties. The results show that the introduction of foreign molecules is a beneficial tool for enhancing the charge transport processes in the preparation of a photovoltaic cell.

Keywords: Nano silicon, sugarcane bagasse, thin films, e-Beam, solar cell