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Substrate and annealing temperature effects on GaAs PN junction solar cells

Yahia Fayiz Makableh

Jordan University of Science and Technology, Jordan

High efficiency solar cells are of a wide interest worldwide due to the higher demand on renewable energy resources. Optimizing the design and fabrication of any type of solar cells is a vital process to minimize any losses due to fabrication limitations and errors. In this work the effect of the optimization of the annealing process was studied. Two scenarios were experimentally investigated in the first scenario the substrate temperature was kept at elevated temperature than room temperature without post annealing. In the second scenario a post annealing process was performed by using RTA technique. As a result, the substrate heating during metal contact deposition by using E-beam evaporation enhanced single junction GaAs solar cells power conversion efficiency by up to 25% compared to the case of post annealing. This result is obtained by the J-V characterization of different single junction GaAs solar cells for both annealing processes.

Biography

Yahia Fayiz Makableh has completed his PhD degree in Electrical Engineering from the University of Arkansas in 2015. Currently he is an Assistant Professor and the Supervisor of the central labs in the Institute of Nanotechnology at Jordan University of Science and Technology. His research is focused on investigating novel optical nanomaterials for high efficiency solar cells and energy harvesting. He also works on self-cleaning surfaces and light weight and high strength nanocomposites. He has published several papers in the field of solar cells and optical nanomaterials.

yfmakableh@just.edu.jo

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