
ICAT'15
INTERNATIONAL CONFERENCE ON ADVANCED TECHNOLOGY & SCIENCES


# International Conference on Advanced Technology & Sciences

**2th International Conference, ICAT'15**
**Antalya, Turkey, August 04-07, 2015**

**Abstracts**

**Omer Faruk BAY**
**Ismail SARITAS (Eds.)**
**Kemal TUTUNCU (Eds.)**

International Conference on Advanced Technology & Sciences, **ICAT'15**
Proceedings of the 2th International Conference on Advanced Technology & Sciences
Antalya, Turkey, August 04-07, 2015

## CONTENTS (Energy)

# A NEW METHOD OF EFFICIENCY ENHANCEMENT IN GAAS SOLAR CELLS

*S.M. MANAKOV, K.K. DIKHANBAYEV*

Physical and Technical Department of Al-Farabi Kazakh National University, 71 Al-Farabi avenue, Almaty, Kazakhstan
sergei.manakov@mail.ru, dkadyrjan@mail.ru

## ABSTRACT

An efficient antireflection coating is critical for the improvement of solar cell performance via increasing of light trapping. In this paper the results of investigation of solar cells based on GaAs with thin film of silicon nitride as antireflection coating are presented. Control samples were Schottky junction solar cells fabricated from experimental GaAs solar cells by chemical etching of antireflection coating and p-type upper emitter layer and chemical deposition Au thin film on n – type GaAs surface. Frontal surfaces both p-n junction and Schottky junction solar cells were covered by of metal-oxide nanoparticles synthesized in counter flow propane-oxygen flame on the surface of nichrome wire. Nanoparticles had the characteristic size of 50-300 nm depending on synthesis conditions and were sprayed on a solar cell surface. It is found that the metal-oxide nanoparticles have significant influence on the antireflection effect and, therefore, improve the solar cell performance. Optimum nanoparticles surface concentrations appropriated to maximal short-circuit current are determined. It is shown that the coating from metal-oxide nanoparticles increase efficiency of solar cells by to 4.7 % due to light scattering on them and increase of a number of photons absorbed in the active region of solar cell.

***KEYWORDS***— *gallium arsenide, Schottky barrier, solar cells, metal-oxide nanoparticles, quantum efficiency*