

OPTOELECTRONIC  
PROPERTIES OF HYDROGENATED  
AMORPHOUS SILICON-CARBON  
AND NANOCRYSTALLINE-SILICON THIN FILMS

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S u m m a r y

Some parameters of thin films fabricated of hydrogenated amorphous silicon-carbon alloys  $a\text{-Si}_{1-x}\text{C}_x\text{:H}$  with  $x = 0$  and 0.5 and nanocrystalline silicon ( $nc\text{-Si}$ ) and serving as a basis for developing solar cells including a Schottky barrier and  $p\text{-i-n}$  and double  $p\text{-i-n}$  heterojunctions have been considered. In double  $p\text{-i-n}$  heterojunctions,  $a\text{-SiC}/a\text{-Si}/nc\text{-Si}$ , the  $p$ -layer was made from  $a\text{-SiC:H}$  and used as a "window", and the  $n$ -layer was made from  $nc\text{-Si}$ . The current-voltage characteristics of solar cells of each type at their illumination are studied. The highest efficiency of 11.5% was found for solar cells with the double  $p\text{-i-n}$  heterojunctions in the case where a cell  $1\text{ cm}^2$  in area was illuminated with light of a  $100\text{-mW/cm}^2$  intensity.