

S. M. Waita, J. M. Mwabora, B.O. Aduda, G. A. Niklasson, S – E. Lindquist and C. G. Granqvist, Performance of Dye Sensitized Solar Cells fabricated from Obliquely DC Sputtered TiO₂ Films, *Africa Jnl. of Science and Technology, Series*, 7(2), (2006) 125 ó 139

Nanocrystalline porous titanium oxide films of varying thickness have been deposited in ambient by reactive DC magnetron sputtering at a fixed but high oblique angle of 60°, and then converted to TiO₂ by thermal annealing at 450 °C for 4 hours. X-ray diffraction analysis of the films showed that they were predominantly of anatase phase, whereas the as deposited films were amorphous. Top-down scanning electron microscope images of the annealed films showed cauliflower-like surfaces, and exhibited well-defined columns. Atomic force microscope images revealed rough surfaces with larger nodules for thicker films. With the annealed films as the working electrodes in a dye-sensitised solar cell, it was established that the photoelectric conversion efficiency increased with the film thickness. The highest efficiency was ~ 3.3 % at an illumination intensity of 100 W/m².