ABSTRACT

Dye-Sensitized Solar Cell (DSSC) is a third generation solar cell from the development of organic solar cells. Efforts to improve the efficiency of DSSC continue to be made. One of them, making anti-reflection layers to increase the absorption of light by reducing the reflection of light by the surface of solar cells. To make the anti-reflection layer a material with a refractive index lower than the refractive index of the substrate is used. In this study, the selected material is TiO2 and SiO2. The anti-reflection thin layer will be fabricated by varying the concentration of the solution, and the thickness of the layer deposited using the spin coating technique. SiO2 anti-reflection layer has several variations of TEOS concentration samples, namely, SiO2 A: 0.33 ml, SiO2 B: 1 ml, and SiO2 C: 3.3 ml, while for ammonia 0.5 ml, DI water 2 ml, ethanol 23 ml concentration variation was not carried out. The TiO2 anti-reflection coating samples had 12.5 ml titanium isopropoide (TTIP) composition, 2 ml isopropanol, DI water 75 ml, nitric acid (HNO3) 65% 0.6 ml. Both types of anti-reflection layers are fabricated on the surface of the glass, then morphological characterization, transmittance test, reflectance test, I-V characterization, IPCE characterization and testing of the anti-reflection layer through evaporation at 70 oC. As a result, in the anti-reflection layer morphology characterized by SEM, it was found that SiO2 B and TiO2 samples had the most even distribution of surface layers and only slightly agglomerated. In the transmittance and reflectance test using UV-Vis, SiO2 B samples have the highest transmittance and the smallest reflectance. The DSSC I-V characterization results obtained 6.15% before spin coating and after adding the anti-reflection layer increased to 6.45%. IPCE test results, SiO_2 B samples have the best light conversion coefficient value than the other samples. So that the addition of anti-reflection occurs to increase the efficiency of DSSC.

Keywords: *DSSC, anti-reflection coating, TiO_2, SiO_2, spin coating, efficiency, transmittance, reflectance.*