ABSTRACT

Carbon flakes are modified carbon materials that the physical and chemical properties are expexted to be better than their bulk counter part, such as high optical transparency and high electrical conductivity. In this present study, carbon flakes have been synthesized using nanoporous carbon and graphite as the original material using electrochemical method. To optimize the optoelectronic properties and the thickness of carbon flakes, there have been done variations on Potassium Sulfate (K_2SO_4)'s solution concentration of 0.1 M and 0.2 M and voltage variations of 5 V, 10 V and 15 V. Absorbance and the changes of electrical conductivity are measured to characterize the thickness and the optoelectronic properties of carbon flakes. Respectively lectrochemical process using 0.2 M K_2SO_4 solution and 10 V voltage resulted flakes graphite of 43.245 μm and the conductivity of 9.736 S/m. This value is greater than the bulk case that has 1.304 S/m of conductivity and 107.359 μm of thickness. The effect of light increases the conductivity up to 6.283 S/m when the light intensiy of 1000 watt/m^2. In case of nanoporous carbon, electrochemical process with 0,1 M K_2SO_4 solution and 10 V voltage resulted flakes of 47.868 μm and the conductivity of 8.932 S/m. This value is greater than the bulk which has conductivity of 2.661 S/m and the thickness of 105.219 μm. The effect of light increases the value of conductivity up to 5.583 S/m when an intensity of 1000 watt/m^2.

Keywords: carbon flakes, nanoporous carbon, graphite, electrochemical