ABSTRACT

Submicrometer Carbon Particles (SMC) are generally defined as the carbon submicro-materials with a sizes ranging from 100-1000 nm. SMC have superior optical properties, especially those that can emit strong photoluminiscence (PL), so that can be applied in the fields of bio-imaging and optoelectronics. Further research is needed to characterize PL properties to determine the effect of synthesis reaction time on emitted emissions. In this study, the SMC were synthesied using the microwave radiation method. The precursors and solvents used in the synthesis were Lysine and Aquades, respectively, with varying synthesis times from 80, 120, 240 and 360 seconds. The PL characterizations show the presence of luminescence in the wavelength range of 400 – 650 nm (visible light) with emission intensity that increases with the increasing reaction time. The maximum intensity is achieved at synthesis time of 240 seconds. Furthermore, when synthesized for 360 seconds, there was a decrease in the intensity of PL emission. The results of the Particle Size Analyzer (PSA) characterization of the 80 second sample showed that the particle size consisted of two groups, where the first had a particle size in the range of 350.7 nm and 2395.5 nm. These results are slightly different with the Scanning Electron Microscopy (SEM) characterization which shows the average of particle sizes are about 133.42 nm and there are some agglomerations. The EDX measurement shows the sampel consists of C, O, In and Cl. Further characterization is needed to study the effect of synthesis time on the SMC size and the resulting photoluminescence.

Keywords: Submicrometer Carbon, lysine, microwave, PL, PSA, SEM.