ABSTRACT

ZnO has been synthesized by the sol-gel method with chelate from pineapple (*Ananas comosus* (L.)) extract, as a solution to reduce the chemical substances. Pineapple extract is used as a chelate because it has high total sugar content. The results of laboratory tests showed the average percentage of the total sugar content of *cayenne* pineapple was 54,29% and *queen* pineapple was 41,30%. ZnO nanostructure that has been synthesized with *cayenne* pineapple chelate was synthesized at calcination temperatures of 500, 600, 700, 800 and 900 ˚C, whereas ZnO nanostructure that has been synthesized with *queen* pineapple chelate was synthesized at calcination temperatures of 700 and 800 ˚C. The morphology of ZnO nanostructure has been checked by Scanning Electron Microscopy (SEM). ZnO nanostructure that has been synthesized with *cayenne* pineapple chelate at calcination temperature of 800 ˚C showed particle size in the range of 5,40 – 3,614 μm with an particle size average of 1,858 μm, these result was still too large and occurred due to agglomeration. The crystallite structure of calcined powders were analyzed using XRD. The average size of zno nanostructure crystallite was synthesized with *cayenne* pineapple chelate at 800 ˚C calcination temperature, which was 35,10 nm while at calcination temperature 700 ˚C the average size of crystallite was 30.90 nm. The diffraction peaks can be indexed as hexagonal wurtzite structure of ZnO (a = 3,25 x 10^{-10} m, c = 5,21 x 10^{-10} m) and diffraction data were in good agreement with the JCPDS card for ZnO (JCPDS 36-1451). The photocatalytic activity of ZnO catalysts obtained by modified sol-gel method at different calcination was valuated for the photo degradation of methylene blue under UV light. The most effective degradation occurred in Zno nanostructure which was synthesized with *cayenne* pineapple as chelate at 700 ˚C calcination temperature during UV irradiation for 240 minutes, the degradation rate was 55,87% at a concentration of 10 ppm MB solution.

Keywords: ZnO, green synthesis, sol-gel method, degradation of methylene blue, calcination temperature