

CHAPTER 4

CONCLUSION

In this research, we aim to synthesize nanostructured metal sulfides which have unique properties and morphologies by using polymers as growth controlling agent via solvothermal method. Different products (CdS , Bi_2S_3 , CuS) were successfully synthesized regardless types of reactants (for example cadmium acetate for CdS , bismuth oxide for Bi_2S_3 and copper chloride for CuS) because they affected slightly on morphologies and properties of the products. Various techniques were used to characterize the products for example XRD, SEM, TEM, UV-NIR, PL and etc. By using these techniques, information including phase purity, morphologies, growth direction, optical properties and etc. were obtained.

According to the experimental results, it was found that the use of polymers strongly affected on morphologies as well as optical properties of the products. The roles of polymers could be capping, templating or both of capping and templating depending on type of polymers.

In addition, the utilizations of metal sulfides to improve the performance of DSSC (Bi_2S_3 as co-sensitizer or CuS as hole conductor) were achieved. Although the efficiency of solar cells was still low, these results pave the new way to improve the performance of the solar cells in the future.