Pengaruh penambahan asam sitrik pada sintesis nanopartikel zno dengan metode presipitasi = The effect of the addition of citrc acid on zno nanoparticle synthesized by precipitation method

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Abstrak

[Seng oksida (ZnO) pada skala nano banyak diteliti karena potensinya sebagai bahan semikonduktor untuk sel surya tersensitasi zat pewarna. Dalam penelitian ini ZnO nanostruktur telah disintesis mengunakan metode presipitasi dengan penambahan asam sitrik (C6H8O7) sebagai agen pembentuk. Dengan variasi rasio ZnO terhadap asam sitrik (1:1, 2:1, 4:1) dan temperatur kalsinasi (150, 200, 400°C) dilihat efeknya terhadap struktur dan kristalinitas. Dengan bantuan XRD, UV-Vis dan SEM data kristalinitas, ukuran kristalit, struktur dan sifat optik material teramati. Hasil penelitian menunjukan partikel ZnO yang terbentuk berada pada rentang ukuran 19.8 – 30.8 nm dengan nilai energi celah pita terendah 3.15 eV berstruktur sperikal bercampur batangan pada rasio 4:1 dan kalsinasi 400°C. Nilai tersebut memungkinan partikel yang tersintesis untuk diaplikasikan pada devais panel surya tersensitasi zat pewarna.
, Zinc Oxide (ZnO) on nano scale was vastly investigated due to its potential as a semiconductor material in dye sensitized solar cell application. In this current research ZnO nanostructure was synthesized using simple precipitation technique with addition of citric acid as capping agent. Various ratios of ZnO and C6H8O7 elaborated 1:1, 2:1, 4:1and calcination temperature of 150, 200, and 400°C were used to investigate the effect of those parameter towards the ZnO structure and crystallinity. By using XRD, SEM, and UV-Vis Spectroscopy the nanostructure characteristics were determined, therein including nanocrystallite size, crystallinity, and optical properties. The results showed that ZnO nanostructure was formed as spherical and rods in the range 19.8 – 30.8 nm and the lowest band gap energy 3.15 ev obtained under condition of ratio 4:1 and calcined at 400°C. Considering the obtained characteristics, the ZnO nanostructures in this study are possible for dye sensitized solar cell application.
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