

Pengaruh doping magnesium mg terhadap morfologi, struktur mikro dan sifat optik nanorod seng oksida (ZnO) = The influence of mg doping on morphology micro structure and optical properties of nanorod (ZnO)

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Abstrak

Nanorod Seng Oksida (ZnO) dengan pemberian variasi doping tunggal Mg sebesar 0%, 1%, 4%, 7% dan 10% disintesis di atas substrat kaca tranparan berlapis indium tin oxide (ITO). Dalam penelitian ini, benih nanorod ZnO dideposisi dengan waktu 10 menit menggunakan metode ultrasonic spray pyrolisis dan ditumbuhkan selama 2 jam dengan metode hidrotermal.

Hasil karakterisasi FE-SEM menunjukkan terbentuknya nanorod ZnO dengan ukuran yang beragam dan arah tumbuh yang mayoritas acak. Hasil spektroskopi UV-Vis menunjukkan nilai absorbansi yang cukup tinggi di daerah panjang gelombang ultraviolet. Pemberian doping Mg terbukti mampu meningkatkan nilai lebar celah pita energi meskipun hasil yang didapatkan pada penelitian ini cukup jauh dari nilai lebar pita teoritis (~3.37 eV).

Zinc Oxide (ZnO) nanorods were grown on the transparent indium tin oxide (ITO) with the variation of Magnesium (Mg) doping (0%, 1%, 4%, 7% and 10%). In this study, ZnO nanoseeds were deposited in 10 minutes using ultrasonic spray pyrolysis method and were grown for 2 hours using hydrothermal method.

The characterization of surface morphology using field emission scanning electron microscopy (FESEM) exhibits ZnO nanorods with various diameter and random growth direction. The optical properties were studied through UV-Vis and shows high absorption in ultraviolet spectrum area. Mg dopant could increase the bandgap of ZnO nanorods, though it's still lower from the theoretical bandgap (~3.37 eV).