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Synthesis of ZnO nanoparticles by Spray-pyrolysis method for photo-catalytic application

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Recuntly ZnO nanoparticles have been investigated as the photocatalyst widely. ZnO nanopartielcs were prepared from Zn(CH3COO)2·2H2O source by spray-pyrolysis method with changing synthesis temperature. We studied on photocatalytic activity of the ZnO nanoparticles as compared with commercial Degussa TiO2(p-25) powder. When the ZnO nanoparticles irradiated by UV light, ZnO nanoparticles have catalyzed redox reactions in presence of O2/air/water and degraded methylene blue(MB) in water solution. We carried out O2 plasma treatment to focus on the ratio of zinc to oxygen of hand made ZnO nanoparticles. After O2 plasma treatment of ZnO nanoparticles its photo-catalytic activity was increased rapidly. The characterization of ZnO nanoparticles were analyzed by Transmission Electron Microscopy (TEM), Energy Dispersive Spectrometer (EDS) and BET test. Also we defined the photocatalytic activity of ZnO nanoparticles using UV-VIS Spectroscopy.

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Position-controlled ZnO nanoflower arrays grown on glass substrates for electron emitter application

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We report on the position-controlled growth of ZnO nanoflowers composed of several nanoneedles with a sharp tip on a conducting glass substrate by chemical solution deposition method. The position of ZnO nanoflowers was controlled by preparing the polymethylmethacrylate (PMMA) submicron patterns on substrates using e-beam lithography. ZnO nanoflower arrays exhibited excellent electron emission characteristics showing a low turn-on voltage of 0.13 V/mm at the criterion of 0.1 mA/cm2 and a high emission current of 0.8 mA/cm2 in the applied electric field of 9.0 V/mm. Furthermore, the light emitting devices using ZnO nanoflower arrays clearly demonstrated strong light emission.