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Preparasi karakterisasi dan aktivitas fotokatalitik oksida seng / titanium dioksida / oksida tembaga (zno tio2 cuo) dengan metilen biru sebagai model polutan = Preparation characterization and photocatalytic activity of zinc oxide titanium dioxide copper oxide zno tio2 cuo using methylene blue as pollutant model

Alfred Albert, author

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Abstrak

Campuran Oksida Seng/Titanium Dioksida/Oksida Tembaga (ZnO/TiO2/CuO) dengan lima variasi rasio molar CuO disintesis dengan menggunakan metode sol-gel dan dikarakterisasi menggunakan Energy Dispersive X-Ray (EDX), X-Ray Diffraction (XRD), Field Emission Scanning Electron Microscope (FESEM) dan UV-visible Diffuse Reflectance Spectroscopy (UV- DRS). Aktivitas fotokatalitik diamati menggunakan larutan metilen biru (MB) di bawah pemaparan sinar Ultraviolet (UV) dan cahaya tampak dengan metal oksida ZnO/TiO2 sebagai pembanding. Hasil aktivitas fotokatalitik menunjukkan sampel dengan rasio molar CuO sebesar 0.5 dapat mendegradasi lebih baik di bawah paparan sinar UV dan cahaya tampak. Kondisi optimum aktivitas fotokatalitik didapatkan pada kondisi pH 13, dosis fotokatalis 0.2 g/L dan konsentrasi awal MB 20 mg/L baik di bawah paparan sinar UV maupun cahaya tampak.
.....Zinc Oxide/Titanium Dioxide/Copper Oxide (ZnO/TiO2/CuO) metal oxide mixture with five various CuO molar ratio were synthesized using sol-gel method and were characterized by Energy Dispersive X-Ray (EDX), X-Ray Diffraction (XRD), Field Emission Scanning Electron Microscope (FESEM) and Ultraviolet- visible Diffuse Reflectance Spectroscopy (UV-DRS). Photocatalytic activities were observed by using methylene blue (MB) solution under Ultraviolet (UV) light and visible light irradiation using photocatalytic activity of ZnO/TiO2 metal oxide mixture as comparison. The result shows sample with 0.5 ratio molar of CuO have higher degradation capability on both UV light and visible light irradiation. Photocatalytic activity optimum condition were obtained at pH 13, 0.2 g/L of photocatalyst and 20 mg/L of MB initial concentration.