

**THE EFFECT OF DYE CONCENTRATION TO THE OPTICAL  
PROPERTIES OF FITC-DOPED SILICA NANOPARTICLES**

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## ABSTRACT

### THE EFFECT OF DYE CONCENTRATION TO THE OPTICAL PROPERTIES OF FITC-DOPED SILICA NANOPARTICLES

FITC-doped silica nanoparticles (NPs) was successfully synthesized via sol-gel method. Fluorescein isothiocyanate (FITC) was incorporated on the silica nanoparticles using crosslinker agent of 3-aminopropyl-triethoxysilane (APTES). Based on this method, ethanol, aqueous ammonia, water, tetraethyl orthosilicate (TEOS) and APTES were served as constant variables while the concentration of dye was taken as manipulated variable. Six experiment trials were made where the first sample was used as a control sample with no addition of dye while the remaining five sample with different dye concentration. The particle characterization was carried out using X-ray Diffractometer (XRD), Scanning Electron Microscope (SEM), Energy-dispersive X-ray Spectroscopy (EDS), Photoluminescence Spectrometer (PLS), Fourier Transform Infrared (FTIR) and Ultraviolet-visible Spectroscopy (UV-vis). XRD result shows an amorphous structure with broad band of  $22^\circ$ . SEM confirms the size of particles were within the range of nanoscale of average size of 81.25 nm. EDS denote the element present in the nanoparticles which are Si, O, N, C and S. Meanwhile, the PLS analysis illustrate the optical properties of FITC-doped silica NPs which result in decreasing fluorescent intensity as dye concentration increased. Finally, FTIR and UV-vis shows the presence of silica and carbonyl group based on the incorporation of dye.

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