

Photophysical behavior of Nile Red in the presence of colloidal TiO₂ particles.

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The emission behavior of Nile Red has been examined in the presence of colloidal TiO₂ in acetonitrile. The fluorescence intensity of Nile Red was found to decrease on increasing the concentration of TiO₂ and the quenching was found to follow Stern-Volmer relationship. However its emission lifetime was not affected in the presence of these colloidal particles. The absorption spectrum of Nile Red TiO₂ mixture showed a new peak around 650nm indicating that there is complex formation in the ground state between Nile Red and TiO₂. The complex was found to be non-fluorescent. From the Stern-Volmer plot the association constant (K_s) for the complex formation was calculated to be $1.52 \times 10^2 \text{ M}^{-1}$. On the basis of the above results the quenching of Nile Red emission by colloidal TiO₂ is concluded to be static in nature.