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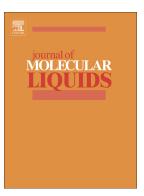
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CCEPTED MANUSCRIPT

Surface Dynamics Associated with Zinc Oxide Nanoparticles and

**Biomolecules in Presence of Surfactants** 

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**Abstract** 

This work reports the physicochemical parameters and the nature of association between Zinc

oxide nanoparticles (ZnO NPs) and biomolecules viz., Bovine serum albumin (BSA) and

Deoxyribonucleic acid (DNA) in presence of cationic, anionic and non-ionic surfactants. Zinc

oxide nanoparticles are first synthesized using wet chemical method and subsequently

characterized by FTIR, XRD, SEM, TEM and EDAX studies. The nanoparticle-protein

interactions were studied using UV-vis spectroscopy, fluorescence spectroscopy, Dynamic

light scattering studies, circular dichroism techniques and SDS-PAGE technique. The

spectroscopic investigation sheds light into various aspects of binding during the molecular

association of BSA with the ZnO NPs in absence and presence of cationic, anionic and non-

ionic surfactants. The nanoparticles-DNA interactions were studied in presence and absence

of surfactants by gel electrophoresis. Anionic and non-ionic surfactants were found to impart

long-term stability to ZnO NPs. This study provides valuable mechanistic insights into the

interactions taking place at the interface of the nanoparticles which further helps in designing

stable colloidal ZnO NPs systems.

**Keywords:** ZnO nanoparticles; Surfactants; BSA; DNA

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