# Ultraviolet-visible Spectroscopic Study of the Microenvironment of AOT Reverse Micelles in the Presence of Non-ionic Additives

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Reverse micelle systems can be considered as intermediate systems between complex biological water cavities and wall pores in solid media. They are resembled to pockets of water included in bioaggregates such as membranes and mitochondrial matrix, where water is not in its bulk state but confined to small cavities whose size and wall nature determine the way of water organisation.

Several features of reverse micelles remain to be solved, e.g. water structure close to the interface, water activity and internal pH in the water nanocage. Ionic reverse micelles represent a good model to study the properties of water aggregates close to the ionic center [1]. The additives of nonionic kosmotropes and chaotropes also influence the water structure in water pockets of reverse micelles [2].

The purposes of the presented work were: a) study the interactions of o-nitroaniline with reverse micelles of AOT in hexane; b) Revealing of influence of additives of nonionic kosmotropes and chaotropes on the changes in electronic absorption spectra of o-nitroaniline.

Microemulsions were prepared on the basis of AOT, hexane, water, water solutions of glucose, galactose, chloral hydrate and urea. UV-vis absorption spectra were recorded in a UV-visible spectrophotometer Optizen POP using 1 cm path length cells. Binding constants of o-NA with AOT micelles were calculated by absorption data of o-NA at wavelengths of 376 and 398 nm in hexane (0.0M and 0.1M AOT). Concentrations of free and bound o-NA were determined by equation systems at intermediate concentrations of AOT.

Binding constants of o-nitroaniline with AOT reverse micelles are greater in the presence of chaotropic urea and chloral hydrate in comparison with kosmotropic glucose and galactose. This may be conditioned by different arrangement of nonionic kosmotropes and chaotropes in the water core of reverse micelle.

Results may be useful in the investigations water structure, when it is confined to nanometer-scale cavities, viz. in biological systems.

[1] R.D.Falcone et al., Organic Chemistry in Argentina, ARKIVOC, 2011, 369-379.

[2] R. Itri et al.,Brazilian Journal of Physics, 2004,34(1),58-63