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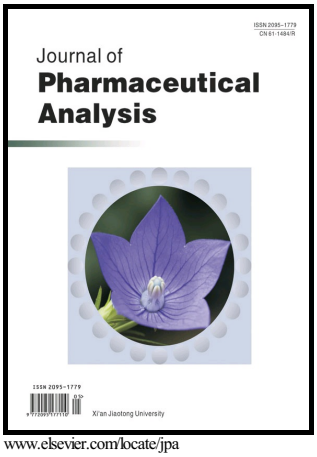

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Denaturation studies on bovine serum albumin – bile salt system: bile salt stabilizes bovine serum albumin through hydrophobicity

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Abstract

Protein denaturation is a study of intensive research, since it leads to neurological disorders of high consequences. Avoiding denaturation and stabilizing the proteins in their native state is of great importance, especially when proteins are used as drug molecules or vaccines. It is preferred to add pharmaceutical excipients in protein formulations to avoid denaturation and thereby stabilize them. The present study aims at using bile salts (BSs), a group of well - known drug delivery systems, for stabilization of proteins. Bovine serum albumin (BSA) is taken as the model protein, whose association with two BSs, namely sodium cholate (NaC) and sodium deoxycholate (NaDC), is studied here. Denaturation studies on the pre-formed BSA-BS systems are carried out under chemical and physical denaturation conditions. Urea is used as the chemical denaturant and BSA-BS systems are subjected to various temperature conditions, to understand the thermal (physical) denaturation. With the denaturation conditions prescribed here, the data obtained is informative on the association of BSA-BS systems to be hydrophobic and this effect of hydrophobicity plays an important role in stabilizing the serum albumin in its native state under both chemical and thermal denaturation.

Keywords: Bile salts, Bovine serum albumin, Chemical denaturation, Thermal denaturation, Tryptophan fluorescence, Protein stabilization.

1. Introduction