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Conductometric and fluorescence probe analysis on molecular interactions between cationic surfactants in aqueous medium of glycyl dipeptide: Concentration and temperature effect

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The effect of cationic micelles of cetyltrimethylammonium bromide (CTAB) and dodecyltrimethylammonium bromide (DTAB) on interactions of glycyl dipeptide in aqueous medium have been studied in varying concentrations (0.001, 0.005 and 0.010 mol·kg⁻¹) at different temperatures (293.15K to 293.15K). The conductivity method is employed to determine critical micelle concentration, CMC i.e., point of aggregation and the results have been discussed in terms of glycyglycine-CTAB/DTAB hydrophobic and electrostatic interactions in aqueous medium. The obtained CMC values reveal the fact that the micellization tendency of the surfactant increases in the presence of glycyl dipeptide. The CMC's of CTAB and DTAB have been found to decrease from 0.87 to 0.66mmol·kg⁻¹ and 14.2 to 13.7mmol·kg⁻¹ respectively as the [Glycyl dipeptide] increased from 0.001 to 0.01mmol·kg⁻¹. The temperature dependence of the CMC values has been established in terms of ion-ion, ion-polar and hydrophobic-hydrophobic group interactions around the hydrophobic part of surfactants. Furthermore, the standard thermodynamic parameters of micellization have been evaluated and interpreted which enable to grasp fully the ion-ion/ion-hydrophilic interactions existing in the present ternary (surfactant-dipeptide-water) system. In addition, the pyrene fluorescence study has been used to study the change of micropolarity produced by the interactions of surfactants with glycyl dipeptide and the aggregation behaviour (CMC determination) of surfactants.

Biography

Suvarcha Chauhan has completed her PhD in 1988 from Himachal Pradesh University, Shimla and worked as Post-doctoral Fellow at Department of Chemistry, Himachal Pradesh University, Shimla for 11 years and joined as Assistant Professor in the same department in 2001. She has published about 107 papers in reputed journals of national and international repute with 19 papers h-indexed and 46 papers i-10 indexed and has ~1200 citations to her credit.

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