Surface, thermodynamic parameters and critical packing factor of (2- (alkyloxy) -N, N, N-tris (2-hydroxyethyl) -2-oxoethanaminium chloride

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Abstract

This study consists of preparation of self- aggregating molecules and identification of the chemical structure of their molecules then studying the physical and chemical properties and evaluation the thermodynamic parameters. Four cationic surfactants (2- (alkyloxy) -N, N, N-tris (2-hydroxyethyl) -2-oxoethanaminium chloride were prepared from fatty alcohol, chloroacetic acid and triethanolamine. Elementary analysis, infrared analysis and H1NMR were used to investigate such surfactants. Several studied were carried on the aqueous surfactant solution. These studies include surface and interfacial tension measurements, Values of critical micelle concentration "CMC", efficiency "P_{C20}", and effectiveness "γ_{cmc}" were determined. Free energies of micellization and adsorption of the prepared surfactants in the aqueous solution at (25 ^{o}C) were calculated. Measurements of the interfacial tension and HLB calculations were performed for different surfactants solutions. Calculation the critical packing parameter "P" indicates the optimal aggregation shape of the amphiphiles. The calculated critical packing factor was found to be > 0.33. It indicates that the cylindrical micelles are the predominant shape for the synthesized amphiphiles.