Mini Research Proposal On

STUDY ON EFFECT OF SODIUM STEARATE SURFACTANTIN MIXED SOLVENT MEDIA

Brahamdeo Yadav

Department of Chemistry

SuryanarayanStyanarayanMarabaita Yadav Multiple Campus, Siraha

(Tribhuvan University), Nepal

Mentor of

Prof. Dr. Ajaya Bhattarai

Department of Chemistry, Mahendra Morang Adarsh Multiple Campus, T. U., Biratnagar

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1. **Background**

1.1 GeneralIntroduction

Surfactants are surface active agents .which are amphiphilic in nature containing both hydrophobic part(nonpolar group) and hydrophilic part (polar group) in their structure.They self-aggregate in aqueous solutions, and because the surfactants contain both polar and non-polar groups, the aggregated form is known as a micelle..Theconcentration where micelle is formedis called the critical micelle concentration (CMC)(Rosen, 2004). Temperature, additives, pH, concentration, type of the mixed solvent media, and other factors all affect how micelles are formed.Surface tension, also known as interfacial tension, between two liquids or between a liquid and a solid is reduced by surfactants. Surfactants are often thought to be the substance that influences the interfacial surface tension, but in reality, they can also function as wetting agents, emulsifiers, foaming agents, and dispersants.

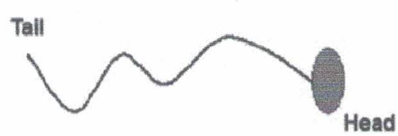

Fig: Surfactant.

1.2 Classification of Surfactants:

Examples Structure

Based upon the composition of the surfactants and its polarity, they are classified as:

Nonionic Surfactant

Anionic surfactant

Cationic surfactant

Amphoteric or zwitterionic surfactant

2. **Statement of the problem:**

The dye and surfactant interact with each other in the solution is very common. Nowadays various research works related with water was investigated , but in case of organic solvent –

water mixed solvent media provide the wide range of critical micelle concentrationofmixed surfactants sodium stearate .Alcohol is an organic solvent that can be combined with water to lower the dielectric constant of the resulting solvent mixture. the impact of solvent composition on conductivity measurement. Experiments of surfactantssodium stearate gives variation on the critical micelle concentration and the temperatures effect will also give different values of critical micelle concentration.

3. Objectives:

General Objective:

To study theeffect of interaction betweensodium stearate and methanol water mixed solvent media.

Specific Objective:

To measure the effect of temperature on conductance, ofsurfactants sodium stearate solution in mixed solvent media.

To measure the effect of concentration on conductance of mixed surfactants sodium stearate solution in mixed solvent media.

To study the corrosion protection properties of surfactants.

4. Review of Pertinent Literature:

(Shah et al. 2014) has been measured the specific conductivity of solutions of cetyltrimethylammonium bromide (CTAB) in absence and in the presence of potassium chloride in methanol-water mixed solvent media containing 0.10, 0.20, 0.30 and 0.40 volume fractions of methanol at 308.15, 318.15 and 323.15 K. The conductance of cetyltrimethylammonium bromide decreased with addition of methanol. It was observed that the conductance of cetyltrimethylammonium bromide increased with increase in concentration as well as with addition of salt (KCl). The concentrations of KCl were taken 0.0001, 0.001 and 0.01 M during the experiments. The result showed that critical micelle concentration of cetyltrimethylammonium bromide increased with addition of methanol and with rise of temperature. (Yadav et al. 2013) investigated the comparative study of conductance of sodium dodecyl sulphate in different percentage of ethanol water mixed solvent media at 318. 15 K and found the conductance decreased with increase of ethanol. Also, Researchers (Niraula et al., 2013) looked at the impact of NaBr on the micellization of sodium dodecyl sulphate in pure water and methanol water mixed solvent media at different temperatures, containing 0.1, 0.2, 0.3, and 0.4 volume fractions of methanol at 308.15 and 318.15 K. When methanol was introduced, conductivity was lowered. It was shown that increasing the concentration and adding salt (NaBr) both increased the conductivity of sodium dodecyl sulphate. The results showed that adding sodium bromide decreased the critical micelle concentration, whereas adding methanol and raising the temperature raised it. (2017) (Bhattarai et al.) have examined their interactions with individual solutions of water and methanol-water mixes and found that combined micelle formation lowers surface tension. (2018) Dodecyltrimethylammonium bromide conductivity experiments were carried out by Shahi et al. at 289.15 K with Brij-35 present.Using the graph of specific conductivity vs. concentration, the critical micelle concentration (CMC) for dodecyl trimethylammonium bromide in the presence of Brij-35 is determined. The CMC of dodecyl trimethylammonium bromide is less than it would be in the absence of dodecyl trimethylammonium bromide [DTAB] when Brij-35 is present.

Research Gap:

No more work has been done for conductivity, or viscosity studies of our proposed sodium stearate surfactants in mixed solvent media

5. Methodology:

Materials:

sodium stearate as anionic

Preparation of mixed solvent media:-Series of solvent will be prepared containing various solvent composition of methanol-water mixture(0%, 10%,20%,) in the airtight volumetric flasks.

Methods:

Interaction of mixed surfactants will be studied by determining the CMC adopting following methods

Conductance Measurement: By calculating the CMC with a digital conductivity meter (306) model coupled to a water flow thermostat at a frequency of 200 Hz using a dip-type cell with a cell constant of 1.0 cm-1, the interaction of the surfactant sodium stearate will be explored.

Utilizing the estimated concentration range, the cell was calibrated with KCl solutions. Before beginning the experiment, 10 ml of the reference solution (water) or about equal amounts of each additive in water will be placed in the conductivity cell and allowed to equilibrate for 1 hour at the designated temperature. From a micropipette, a known concentration of sodium stearate surfactants prepared using the same reference solution is then added, and the conductivity value is adjusted until it becomes constant.The precise conductance of sodium stearate surfactants in an alcohol-water solvent was thus measured. The conductance measurements' error was zero.

6. **Expected outcomes of the study:**

Only the conductivity characteristics of the surfactant in an alcohol-water mixture solvent are being studied in this experiment. The field of textile industries can really benefit from this experimental work. These study concepts will be used to raise the caliber of textile goods. By lowering the interfacial tension between two substances, surfactant plays a critical role in washing processes.

7. **Limitation of the study:**

The effects of temperature for conductance will not be possible for sodium stearate surfactantsinteractionin alcohol-water mixed solvent media. This is the serious limitations for the proposed investigation.

8. **Significance of the study:**

This study's major goal is to investigate the conductivity characteristics of alcohol-water mixed solvent media. These research concepts, for instance, will be used by the textile industry to raise the caliber of textile goods. This study has a significant practical application. By reducing the interfacial tension between water and an oily substance, surfactants have a significant impact on the cleaning action. In order to prepare tooth paste, toilet creams, and other creams that improve the complexion, it can be employed in industrial settings. Emulsions can also be stabilized by a surfactant; these emulsions are used extensively in the paint industry as well as for pharmaceutical emulsions.

9. **Budget Estimates**

Item	Amount(Rs)
Contact thermometer, Rely, Water Glass Top, Stand,	25,000
Double distilled water, salt , surfactant,	15,000
Books, seminars, stationary, Secretarial service	5,000
Field work ,analysis of samples, study visit	5,000
Total	**50,000**

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