

❖ **Research Collaboration :-**

1. Mr. Bhaskar K. Nikam (**Research Student**)
2. Dr. M. S. Borse, (**Chemistry**), Uttamrao Patil College, Dahivel (**Research Guide**)
3. Dr. Vilas. B. Jadhav (**Chemistry**), Z.B. Patil ASC College, Deopur, District- Dhule, (**Research Co-guide**)

➤ **MOU**



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Mob. : 9421536443

Prin. Dr. B.D. Borse
(M.Sc., Ph.D.)
Mob. : 9130955910

Out ward No.- UPCD/

Date : 15-06-2020

RESEARCH COLLABORATION AGREEMENT

Prepared for

Dr. V. B. Jadhav

J. E. T.'S Zulal Bhilajirao Patil College, Dhule, Tal- Dhule Dist-Dhule, M. S.

Prepared by **Dr. M. S. Borse**

Navoday Shaikshanik Sasstha Dhule's Uttamrao Patil Arts and Science College, Dahiwel, Tal-Sakri, Dist-Dhule (M. S.)

June 2020

THE PARTIES

This RESEARCH COLLABORATION AGREEMENT is made and entered into by and between **Dr. M. S. Borse** with an official address at **Navoday Shaikshanik Sasstha Dhule's Uttamrao Patil Arts and Science College, Dahiwel, Tal-Sakri, Dist-Dhule (M. S.)** and **Dr. V. B. Jadhav** with an official address at **J. E. T.'S Zulal Bhilajirao Patil College, Dhule, Tal- Dhule Dist-Dhule, M. S.** effective as of **15th June 2020 (effective date)**

The institute and the researcher are each referred to as a "Party" and collectively as "Parties"



NATURE OF AGREEMENT

Both Parties wish to collaborate and work on a research in the field of Chemical Sciences that requires both parties to transfer between laboratories and exchange research material and other required information necessary to commence and complete the stated research.

Nothing in this agreement shall be construed to limit the freedom of either Party to engage in similar research activities with the other Party.

DUTIES AND RESPONSIBILITIES:

- ❖ The researcher agrees to conduct the necessary experiments, extensive research, and collaborate with the institute to complete the Research.
- ❖ The institute agrees to provide the necessary resources, research material, equipment, and additional funds to assist the Research.

SCOPE OF WORK:

- ❖ The parties shall work and collaborate on the research to obtain vital information about the topic of the research.
- ❖ The Parties shall exchange all information, including the final results of the Research regularly by the means the Parties decide.

OWNERSHIP & RIGHTS:

Both Parties their respective proprietary rights on the research in the execution of their respective obligations under this agreement.

TERMS & CONDITIONS:

1. Collection of data:

Both Parties agree to gather and exchange information and material on the research topic/project.

2. Cost and Expenses:

The institutes/researchers cover any additional cost and expenses for the research.

3. Term & Termination:



The agreement shall remain effective for **five (5)** commencing on the stated effective date

4. Books & Records:

Both Parties agrees to keep a printed and digital copy of all information about the research for record purpose only.

5. Confidentiality:

Any information concerning the Parties' collaboration and Research shall remain in the strict confidence.

GENERAL PROVISIONS:

All notices that are necessary shall be provided in writing and delivered through mail or email.

This Agreement shall constitute the entire agreement between the Parties and shall replace any other previous agreements.

ACCEPTANCE:

IN WITNESS WHEREOF, each of the Parties has executed This Research collaboration Agreement as of the day and year set forth above.

Date: **15 June 2020**

Place: Dahiwel

Parties

Faculty: (Dr. M.S. Borse)

Signature
प्रचार्य

उत्तमराव पाटील कला व विज्ञान
महाविद्यालय दहिवेल, ता. साक्री, जि. धुळे

Head
(Dr. V. B. Jadhav)

Department of Chemistry
Zulal Bhilajirao Patil College

Principal
Signature

PRINCIPAL

Jai Hind Educational Trust's
Zulal Bhilajirao Patil College
Shikshanmaharshi
Nanasaheb Z.B. Patil Marg
Dcopur, DHULE- 424002



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➤ **Research Center** : Registration Letter of Ph.D. Student



KAVAYITRI BAHINABAI CHAUDHARI NORTH MAHARASHTRA UNIVERSITY, JALGAON

KBCNMU/11/Ph.D./Conf.Letter/Online/ Chem. /2021

Date : 03-09-2021

To,

Mr. BHASKAR KEVAL NIKAM

Subject:- Admission to Ph.D. Course in the Subject of Chemistry under the faculty of Science and Technology

Sir/Madam,

With reference to the above subject, this is to inform you that, you were provisionally registered for Ph.D. course in the subject to **Chemistry** under the faculty of **Science and Technology**. Now, after successful presentation of your research outline before RRC meeting and completing of Pre-Ph.D. Course work, the University authorities have confirmed your admission to Ph.D. course in the above subject and faculty. The particulars of your admission are as below :-

Registration Details		
a)	Name of Guide	Dr. Borse Mahendra Sahebrao
b)	Name of Co-guide (if any)	Dr. Jadhav Vilas Bhaskar
c)	Place of Research Work	JAI HIND EDUCATION TRUSTS ZULAL BHILAJIRAO PATIL ARTS, COMMERCE AND SCIENCE COLLEGE DEOPUR DHULE
d)	Date of Registration	02-11-2020
e)	Date of Approval of Research Title (RRC)	28-08-2021
f)	Application No.	PHD-2019-1BM273
g)	Topic of Research	Study of Clouding phenomena of mixed surfactants system Influence by various additives in aqueous medium

Paper	Paper I (Research Methodology & Research and Publication Ethics)	Paper - II (Subject Specific Course)	Paper - III (Guide Course)
Grade	C	O	O

Note :-

1. **Rules and regulations regarding Ph.D. are as per UGC regulation, 2009 (Minimum Standards and Procedure for Awards of M.Phil/Ph.D. degree) and Ph.D. Guideline-2017 of Kavayitri Bahinabai Chaudhari North Maharashtra University, Jalgaon amended from time to time and fees will be applicable as stated in provisional registration letter.**
2. You are requested to apply for eligibility certificate to the Research section of this university within Six Months from the date of issue of this letter. The eligibility fee is Rs. 500/- and late fee of Rs. 1000/- will be charged if the candidate fails to apply for eligibility certificate within Six Months from the date of issue of this letter. To fulfill eligibility within one year from the date of issue of the letter is mandatory, otherwise your admission is liable to be cancelled. (Ph.D Guidelines -2017, Annexure-IV).
3. **Six Monthly Progress Report** : The students are required to upload their Six Monthly Progress report Online in Softcopy (PDF) format through their Login every six month. For this purpose, the login of the students will be opened for a period of one month after every six month. This softcopy will be submitted after the approval of guide. The Six Monthly progress Report should be submitted date to date in time i.e. from the date of approval of research title. (Ph.D. Guidelines 2017, Annexure- V).
4. The students are required to submit a copy of all Six Monthly Progress Reports signed and duly endorsed by guide at the time of permission for submission of synopsis in the University.
5. The candidate should pay tuition fee as well as other fees regularly in time. The fee structure and late fee, during the Process for Ph.D. degree will be as prescribed by the University authorities from time to time.
6. The candidate should submit a photocopy/ hard copy of these letter to the Research Section of the University immediately after the receipt.

Yours faithfully,

sd/-

(Shri. V. V. Talele)
Assistant Registrar
Research Section

➤ Research Paper published in collaboration with...(Snaps):-

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Unraveling the thermodynamic and clouding interactions of non-ionic micelles of polyethylene glycol tert-octylphenyl ether in water-ethanolamine mixtures: Effect of temperature and composition

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ARTICLE INFO

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Ethanolamine

Cloud point

CMC

ABSTRACT

The amines are potentially used as co-surfactants in an emulsion. The formation of mixed-micelle in the mixture of non-ionic surfactant polyethylene glycol tert-octyl phenyl ether (TX-114) in the water-ethanolamine mixed solvent system has been studied by the cloud point method at variable concentrations. In absence of any added compound, CP shows concentration-dependent variation. The values of CP in an aqueous medium are found to increase by enhancing their concentration range. The CP values of 1 % TX-114 solutions were found to either remain steady at lower concentrations and elevated at higher concentrations in the presence of secondary and tertiary ethanolamine. The CP decreases with an increasing number of ethanolic groups, while CP increases with alkyl branching. The ethanolamine's amines show CP variation by insinuating between the head part with proton rich amine groups at the micelle layer. The outcomes are examined within the light of a specific additive's capacity to evacuate water from the head gathering of the surfactant micelles. The stability of mixed micelle system has also been evaluated by foam ability and foam stability data.

1. Introduction

The surfactants are the surface active agents that can alter the surface properties. Surfactants possess dual characteristics as affinity with polar material and also an affinity with non-polar materials. In the aqueous phase, surfactants behave maximum co-operatively resulting in the

water-miscible polyoxyethylene chain, exhibit higher solubility due to hydrogen bonding between the ethers oxygen atom and solvent. The watery surfactant system becomes cloudy with temperature change, known as cloud point (CP). CP is the foremost salient property of non-ionic surfactant, the clear single phase micellar solution is observed at a temperature below CP while distinguished phases were observed

Tuning of Coacervate Phase Behavior of Polyoxymethylene (4) Lauryl Ether in Aqueous Alcoholic Solution: Investigation of Thermodynamics

Mahendra S. Borse^{1,*}, Bhaskar K. Nikam², and Vilas B. Jadhav²

ABSTRACT

In case of non-ionic surfactant, the phase partition behavior (CP) of micellar solution was vary under the influence of various additive mixed systems. The non-ionic surfactant in an aqueous medium shows phase separation above the critical micelle concentration (CMC), There is a change in micellar interactions at cloud point (CP) with increase in temperature. The insertion of foreign material to surfactant solution alters the clouding temperature. In this paper we report how cloud point varies with addition of alcohol as additives. For non-ionic surfactant Polyoxyethylene (4) lauryl ether (Brij-30) the CP temperature was investigated at variable concentrations of surfactant in pure and additive mixed systems. The results we obtained shows that cloud point of pure Brij-30 surfactant decreases with enhancement in surfactant concentration from 1% to 10% (w/v) in a 22% aqueous ethanolic medium. Similarly, the cloud point values of Brij-30 in presence of n-alcohols shows increasing trend in case of propanol and butanol, specifying that their solubilization helps to form swollen water structures, thus favoring micelle hydration, while the presence of alcohols like pentanol, hexanol and heptanol shows a decreasing trend with increasing micelle size. The change in cloud points of Brij-30 in participation of various n-alcohols plays an important role in demonstrating the effect of the nature of additives on the stability of micelle. The foam ability and

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Out ward No.- UPCD/

Date : 25-07-2023

Appreciation Certificate

This is to certified that, **Mr. Bhaskar Keval Nikam**, a registered Ph.D. student under the guidance of Dr. M.S.Borse and Co-guidance of Dr. V.B. Jadhav at University recognised Research centre Jai Hind Education Trusts Zulal Bhilajirao Patil Arts, Commerce and Science College, Deopur Dhule. He is working as part of faculty and students exchange programme between Jai Hind Education Trusts Zulal Bhilajirao Patil Arts, Commerce and Science College, Deopur Dhule and NSSD's Uttamrao Patil Arts and Science College Dahivel, District-Dhule.

We greatly appreciate your efforts to make faculty and student exchange a success.

Thanking you




PRINCIPAL
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