

## Curriculum Vitae

### TALABATTULA RUPAVALLI

Research Scholar Department of Physics  
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### Personal Information

Name : Talabattula Rupavalli  
Date of Birth : 08-12-1985  
Nationality : Indian  
Gender : Female  
Marital Status : Married  
Spoken Languages : English, Telugu (mother tongue), Hindi  
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### Present Position & Experience:

- Assistant Professor in the Department of Physics, S.R.K.R. Engineering College (Autonomous) [NACC 'A+' Grade], Bhimavaram, from 05-03-2026 to the present date, Working
- Senior Lecturer in Degree College, Department of Physics, S.K.S.D. Mahila Kalasa UG & PG(Autonomous) College {NACC 'B++' Grade}, Tanuku, from 01-06-2017 to the present date, Working
- Trainee HR in Rolex Paper Industries Pvt. Ltd. From 2011 to 31-12-2014.
- Physics Teacher in Dr. C.S.N. (E.M) School from 01-06-2007 to 31-03-2009.

### Academic Qualifications

**PhD in Physics** (2022-Present) Department of Physics  
Lovely Professional University-Phagwara, India.

(I will submit the pre-thesis by the end of April 2026)

**MSc in Physics**

(2015-17)

Department of

Physics

Nagarjuna University, Guntur,

A.P., India

CPI:69.5%

**HRM in Master of Business Administration (MBA) (2009-10)**

Indian School of Business Management & Administration (ISBM), India.

CPI: 77.8%

**BSc with Physics, Chemistry and Mathematics (2003-06)**

Dr. C.S.N Degree College, Bhimavaram, (Affiliated to University of A.U.), A.P., India.

CPI:57.0%

**10+2 with Physics, Chemistry, Mathematics, English and Telugu (2001-03)**

Board of Intermediate Education, A.P., India.

CPI: 55.0%

**10<sup>th</sup> standard with Physical Science, Life Science, Mathematics, English and Telugu (2004)** Board of Secondary Education, A.P., India

CPI: 72.3%

### Research experience

- **Research Topic: Ultrasonic and Thermo-Physical properties of Carboxylic Acids and Vitamin Bs at different temperatures**
  - **Sample Preparation:** The study involved preparing and standardizing aqueous solutions of carboxylic acids (Glycolic acid, Lactobionic acid, and  $\alpha$ -lipoic acid) and vitamin B compounds (Thiamine, Biotin, Niacin, D-Panthenol), maintaining accuracy using high-precision balances and degassed, triple-distilled water.
  - **Experimental Techniques:**
    - **Acoustic Measurements:** I have used an Anton Paar DSA 5000 M densimeter with an integrated Peltier thermostat to measure the ultrasonic velocity at various temperatures (288-318 K) and pressures (~0.1 MPa).
    - **Density Measurements:** I gathered high-precision densities at the same time to ensure accurate measurement of bulk factors.
  - **Data Analysis and Derived Parameters:**
    - I calculated apparent molar volume ( $V_{\phi}$ ), limiting molar volume ( $V_{\phi}^0$ ), isentropic compressibility ( $K_{\phi,s}$ ), excess functions, and temperature/concentration relationships.

- Identified transfer qualities ( $\Delta V_{\phi}^0$ ,  $\Delta K_{\phi,s}^0$ ) to understand interactions between solutes and solvents.
- This study looked at the interaction factors for pairs ( $V_{AB}$ ,  $K_{AB}$ ) and triplets ( $V_{ABB}$ ,  $K_{ABB}$ ), as well as the partial molar expansibility ( $E_{\phi}^0$ ) and how it changes with temperature.
- **Spectroscopic Characterization:**
  - The study utilized Fourier Transform Infrared Spectroscopy (FTIR-ATR, 4000–400  $\text{cm}^{-1}$ ) to investigate the interactions between functional groups and hydrogen bonding within the studied systems.
  - Spectroscopic, volumetric, and acoustic data were used to analyze molecular interactions
- **Research Outcomes:**
  - The study revealed interactions between vitamin B molecules and carboxylic acids, including hydrophilic-hydrophilic, hydrophilic-ionic, and hydrogen bonding.
  - Established thermodynamic models useful for pharmaceutical, cosmetic, and food science applications.

### List of Publications/Communication

1. **Temperature-dependent interaction between niacin/D-panthenol in aqueous Alpha-lipoic acid: Physicochemical and spectroscopic analysis**

A manuscript has been published in the Scopus-indexed (Q2-Rank) **Journal of Chemical Thermodynamics and Thermal Analysis**, SJR-0.497 and Impact Factor-1.929. <https://doi.org/10.1016/j.ctta.2025.100234>.

2. **Temperature-Dependent Acoustic and Thermodynamic Study of Vitamin B Compounds in Lactobionic Acid Solutions**

A manuscript has been published in the Scopus-indexed (Q3-Rank) **Journal of Solution Chemistry**, SJR-0.30 and Impact Factor-1.4. <https://doi.org/10.1007/s10953-025-01536-2>.

3. **Thermodynamic analysis of ternary systems containing glycolic acid and water-soluble vitamin Bs: A study of volumetric and spectroscopic properties**

A manuscript has been published in the Scopus-indexed (Q2-Rank) **Journal of Chemical Thermodynamics and Thermal Analysis**, SJR-0.497 and Impact Factor-1.93.

<https://doi.org/10.1016/j.ctta.2026.100279>.

4. **Molecular interaction studies of aqueous glycolic acid with thiamine/biotin: Spectroscopic, acoustical, and volumetric studies**

A manuscript has been communicated in the Scopus-indexed **Journal of Umm Al-**

**Qura University for Applied Sciences, with a high Impact Factor (Q1 Rank).**

5. **Volumetric and Acoustic Analyses of the Thermodynamic Behaviour of Thiamine and Biotin in Aqueous Alpha-Lipoic Acid**

A manuscript has been communicated in the Scopus-indexed **Journal of Chemical & Engineering Data (JCED) (Q<sub>2</sub> Rank)**, Impact Factor-2.4

6. **Thermodynamic investigation of vitamin: A Review (Book Chapter)**

Rupavalli Talabattula, Nabaparna Chakraborty

“Thermodynamic Investigation of Vitamin: A Review” published as a Book Chapter “, **New Frontiers Emerging Science and Technology**”.

7. **Investigating Temperature Effects on Niacin/D-Panthenol interactions in Aqueous Alpha Lipoic Acid: Physicochemical and Spectroscopic Analysis**

A manuscript has been published in the Scopus-indexed American Institute of Physics-Conference Proceedings (AIP-CP).

8. **Intermolecular Interactions in Thermo-Acoustic Investigation of Water-soluble Vitamin B Complexes in various solvent systems: A Comparative Study.**

A manuscript has been published in the **International Journal of Materials Science**.

### Conference and Workshop

1. I have completed the Short-Term course on **Advanced Materials Characterization Techniques: Hands-on-Training and Data Interpretation** organized by Central Instrumentation Facility in Collaboration with Human Resource Development Centre, Lovely Professional University, w.e.f **December 09, 2024 to December 16, 2024**.
2. I have given a Poster Presentation on “**Volumetric and Ultrasonic studies of molecular interactions of glycols in aqueous Vitamin B5 solutions at temperatures**” in the 5<sup>th</sup> International Conference on Recent Advances in Fundamental and Applied Sciences (RAFAS-2024), organized by the School of Chemical Engineering and Physical Sciences, Lovely Professional University, Punjab, India, 19<sup>th</sup>-20<sup>th</sup> April, 2024.
3. I have given a Poster Presentation on “**Investigating Temperature Effects on Niacin/D-Panthenol interactions in Aqueous Alpha lipoic Acid: Physicochemical and Spectroscopic Analysis**” in the 6<sup>th</sup> International Conference on Recent Advances in Fundamental and Applied Sciences (**RAFAS-2025**)”, organized by the School of Chemical Engineering and Physical Sciences, Lovely Professional University, Punjab, India, 18<sup>th</sup>-19<sup>th</sup> April, 2025.
4. I have given a PowerPoint Presentation on “Investigation of physicochemical properties of water-soluble vitamin Bs with different solvents” in the International Conference on Frontiers in Physical, Chemical and Biological Sciences: Applications in Agri-Food Technology, Pharmaceutical Innovation and Environmental

Sustainability (FPCBS-2025) held from 5<sup>th</sup> December to 6<sup>th</sup> December 2025, organized by Adikavi Nannaya University Rajamahendravaram, Andhra Pradesh, India.

### Research Highlights

- Investigated ultrasonic and thermo-physical properties of carboxylic acids and vitamin B compounds in aqueous solutions over a wide temperature range.
- Explored solute–solvent and solute–solute molecular interactions through density, acoustic, and volumetric measurements.
- Evaluated derived parameters (apparent molar volume, isentropic compressibility, transfer properties, and interaction coefficients) to understand structural and thermodynamic behavior.
- Correlated experimental results with spectroscopic analysis (FTIR) to probe hydrogen bonding and hydrophilic/hydrophobic interactions.
- Provided fundamental insights with potential applications in pharmaceutical, cosmetic, and food science formulations.

### References

- **Nabaparna Chakraborty** - Department of Physics, Lovely Professional University, Phagwara 144401 Punjab, India; <https://orcid.org/0000-0003-3891-0408>; Email: [nabaparnac@gmail.com](mailto:nabaparnac@gmail.com)
- **Kailash Chandra Juglan** - Department of Physics, Lovely Professional University, Phagwara 144401 Punjab, India; <https://orcid.org/0000-0002-8753-4843>; Email: [kc.juglan@lpu.co.in](mailto:kc.juglan@lpu.co.in)

### Declaration:

I hereby declare that the details stated above are true and correct to the best of my knowledge.