Resume

Name: **Dr. B. L. Tembe**
Affiliation Visiting Professor, Department of Chemistry and Head, Global Center for Indian Knowledge Systems, IIT Dharwad-580011
{Formerly, Professor, Department of Chemistry, Head, Center for Distance Engineering Education Program, and Convener, Interdisciplinary Programme in Educational Technology Indian Institute of Technology, Powai, Mumbai and Dean Students' Welfare, IIT Dharwad}

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Areas of Interest: Theoretical chemistry, Statistical Mechanics, Instructional Design, Educational Technology, Role of Concept Maps in Education, Yogic Sciences, Environmental studies, Indian Knowledge Systems, Music, Vedanta

Personal data **Date of Birth:** 05 - March – 1953

Academic and Professional career

Year	Degree/ Position	University/ Institution
1972	B. Sc.	Karnatak University, Dharwad, India
1974 2015	M. Sc. (Chemistry) M. Sc. (Yoga)	I. I. T. Kanpur (U.P.), India SVYASA University, Bengaluru
1981	Ph. D.	State University of New York at Stony Brook (N.Y.), USA
1981-83	Research Associate	University of Notre dame, Indiana, USA
1983-19 84	Visiting Assistant. Professor.	University of Houston, Texas, USA
1984-86	Lecturer	University of Hyderabad (A.P.), India
1986 - 90	Assistant. Professor	I.I.T. Bombay, India
1991 - 97	Associate. Professor	I.I.T. Bombay, India
1998-20 18	Professor	I.I.T. Bombay, India
1998-99	Visiting Professor	Institute of Molecular Science, Okazaki, Japan
2009-20 13	Head, CDEEP and Convener, IDP, Educational Technology	I.I.T. Bombay, India
2018-	Visiting Professor	IIT Dharwad-580011
2019-23	Dean, Students' Welfare	IIT Dharwad-580011
2023-	Head, Global Center for Excellence in Indian Knowledge Systems	IIT Dharwad-580011

Awards/ Prizes/ Scholarships/ Certificates

a) National Science Talent Scholarship, 1969 to 1974
b) Venkatrao Sirur Gold Medal for standing first in Chemistry in the B.Sc. final examination of the Karnatak University, Dharwar, India in 1972
c) Award for Excellence in Teaching, I.I.T. Bombay, 2002

Memberships of Professional Bodies

a) Life member of the Indian Society for Surface Science and Technology.
b) Life member of the International Society for Theoretical Chemical Physics.

Administrative and Professional Activities
Vice Chairman, GATE (Graduate Aptitude Test in Engineering), 2001
Chairman GATE, 2002
Chairman UGAPEC (Undergraduate Academic Performance Evaluation Committee), 2003
Preparatory Course Coordinator and Faculty Adviser, SC/ST Students, 2004
Chairman SC/ST Cell, 2005
Chairman JAM (Joint Admissions to M. Sc.), 2006

Conferences Attended and Organized
I have attended several national and international conferences such as Gordon Research conferences, International Conferences in Computational Sciences, Conferences in Distance Education and Educational Technology and Theoretical Chemistry Conferences and presented papers and posters. I have also organized workshops and conferences including SERC-DST workshops in Statistical Mechanics.

Projects Carried Out I have completed research projects of DST, CSIR and CDAC.

Topics of research activities

a) Liquid state theory, solvation dynamics and charge transfer b) Physical chemistry at surfaces and interfaces) Stabilities of intermediates and reactive pathways in solution medium d) Mechanism of superionic conduction e) Electron thermalization in gases f) Ion pairs in solvents g) Quantum Oscillators in heat baths h) Instructional Design i) Concept maps j) Statistical Models of Happiness

Selected Publications (Total ~70):

1. "The theory of Fe^{2+} - Fe^{3+} electron exchange in water", B. L. Tembe, H. L. Friedman and M. D. Newton, J. Chem. Phys., **1982**, ***76***, 1490 - 1507
2."Electron thermalization in molecular gases H_2 and N_2" B. L. Tembe and A. Mozumder, J. Chem. Phys., **1983**, ***78***, 2030 - 2038
3."Ligand receptor interactions", B. L. Tembe and J. A. McCammon, Computers and Chemistry, **1984**, ***8***, 281 - 283
4. "Structure and dynamics of the Na+ - Na+, Na+ - Cl- and Cl - -Cl - ion pairs in DMSO", M. Madhusoodanan and B. L. Tembe, J. Phys. Chem, **1995**, ***99***, 45-50
5. Orientations of $Fe(H_2O)_6^{2+}$ and $Fe(H_2O)_6^{3+}$ ions at reactive separations : C. S. Babu, M. Madhusoodanan, G. Sridhar and B. L. Tembe, J. Am. Chem. Soc., **1997**, ***119***, 5679-5781.
6. Dynamics of Na^+-Cl^-, Na^+-Na^+ and Cl^--Cl^- ion pairs in dimethyl sulphoxide : Friction kernels and transmission coefficients : A. K. Das, M. Madhusoodanan and B. L. Tembe, J. Phys. Chem. A, **1997**, ***101***, 2862-2872.
7. Quantum oscillator in a heat bath, P Vallurpalli, P. K. Pandey and B. L. Tembe, G. Allen et al. (Eds.): ICCS **2009**, Part II, LNCS 5545, pp. 197–202, Springer-Verlag Berlin
8. Potentials of Mean Force for the Exo and Endo Solvolysis of 2- Norbornyl Chlorides in Water and DMSO: A Constrained Molecular Dynamics Study, Tiwari, Subodh; Hajari, Timir; Sharma, Ashish; Tembe, B. L, J. Chem. Sc.,**124**, 327-332 (**2012**)
9. B. L. Tembe and S.K.Kamble, "Use of concept maps as an assessment tool in mechanical engineering education", Journal of Learning in Higher Education, **9(1)**, 129-138(**2013**)
10. Solvation structure and dynamics of $MgCl_2$ in water, A. Chatterjee, M. K. Dixit and B. L. Tembe, J. Phys. Chem. A, **2013**, ***117*** (36), 8703–8709.
11. Sonanki Keshri and B. L.Tembe, "Thermodynamics of hydration of fullerols $[C_{60}(OH)_n]$ and hydrogen bond dynamics in their hydration shells, J. Chem. Phys. **146**, 074501 (**2017**)
12. B L Tembe, P Choudhury and H R Nagendra, "A statistical model for quantification of large Collective Entities", International Journal of Yoga – Philosophy, Psychology and Parapsychology, **6**, 74-93 (**2018**)

Theses Supervised

Ph. D.

P. Vijayakumar Solvation Structure and Dynamics in Ferrous- Ferric electron exchange, University of Hyderabad (1991)

C. Satheesan Babu Studies in the structure, dynamics and solvation in molecular fluids, University of Hyderabad (1991)
D.H.S. Ramkumar, Process Engineering studies of THF-GBL-Water system I.I.T. Bombay-1990; Superviser: Prof. A.P. Kudchadker (Co- superviser : B. L. Tembe)
M. Madhusoodanan Structures in molecular fluids and the PMF in DMSO I.I.T Bombay, (1995)
A. K. Das Simulation Studies on the Sodium Chloride ion pair in DMSO and water-DMSO mixtures, I.I.T. Bombay (1998)
Asrar A. Siddique, Molecular dynamics of ion pairs in DMSO-water and acetone-water mixtures and

Associations of methane in aqueous solutions of urea and glycine- betaine (2015)

Atanu Sarkar, Studies of solvation in supercritical fluids (2016)

Mayank Kumar Dixit, Solvation structures and dynamics of (a) sodium halides in DMSO-MeOH, (b) MgCl2 in water-ethanol and (c) hydrophobic solutes in aqueous solutions of urea-taurine and urea-sarcosine and Fourier Grid Hamiltonian method to study the vibrational spectra and back-propagation method for computing potential energy curves (2015)
Sachin Kamble, Use of Concept maps and an instructional design model on students' performance in the classroom teaching of thermodynamics and internal combustion engines (2016), Co-Guide. Prof. U. N. Gaitonde
Ujjwala Patil Studies of solvation of alkali halides in water acetonitrile mixtures (2017)
Sonanki Keshri Solvation studies of fullerols and ion pairs in polar fluids (2018)

M. Phil.

P. Vijayakumar Solvent dynamics in a model system (1985)
S. Venkateswara Rao Thermodynamics of fatty acid mixtures at the air/water interterface, (1986)

M. Sc

About 50 in number

Teaching experience (Courses taught):

1) First year undergraduate chemistry laboratory 2) Statistical mechanics in chemistry
3) Mathematical methods in chemistry
4) Structure and Bonding/ Chemical bond and Molecular Geometry
5) Molecular spectroscopy 6) Quantum Chemistry
7) Energetics and kinetics/ Rate Processes 8) Chemical and statistical thermodynamics
9) Computer methods in chemistry/ Chemistry and computers
10) Physical chemistry laboratories 11) Undergraduate chemistry (Physical Chemistry) - I
Topics: (i) FT-NMR methods ii) Dielectric Relaxation (iii) Charge transfer processes
(iv) Stochastic Processes (v) Solid state chemistry (vi) Instructional Design
11) Environmental Studies 12) Quantum Field Theory
13) Happiness and Wellbeing 14) Introduction to Indian Knowledge Systems-1
15) Introduction to Music - 1

Publications: Books (Edited/Authored)

1. Atoms and Molecules (For India Gandhi National Open University)
2. Energetics and Dynamics (For India Gandhi National Open University)
3. Equilibria and Electrochemistry (For India Gandhi National Open University)
4. Inorganic Chemistry (For India Gandhi National Open University)
5. Organic Chemistry (For India Gandhi National Open University)
6. Engineering Chemistry-I (NPTEL WEB book, 2008)
7. Statistical Mechanics (NPTEL Video Book, 2013)
8. Physical Chemistry-II (NPTEL Web Book, 2013-14)
9. Chemical Thermodynamics (NPTEL Web Book, 2013-14)
10. Computational Chemistry (NPTEL Web Book, 2013)