

RESUME

1. **Name:** Dr. Mintu Halder (E-mail: mintu@chem.iitkgp.ernet.in, mhchem@gmail.com)

2. **Address:**

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3. **Academic Qualifications: M. Sc., Ph. D.**

4. **Current position:** Associate Professor, Department of Chemistry, I. I. T. Kharagpur, Kharagpur-721302, West Bengal, India.

5. **Research experience:**

Expertise in Ultrafast Laser spectroscopy, Biophysical Chemistry, Experimental Chemical dynamics, Time resolved spectroscopy, Pump-probe and Laser flash photolysis, Magnetic field effect in chemistry, Gas phase spectroscopy, and Condensed phase dynamics, ligand binding in proteins, protein electrostatics.

6. **Teaching experience:**

(a) Lecturer, Department of Chemistry and Chemical Technology, Vidyasagar University, West Bengal, India (during 1999-2002).

(b) Guest Lecturer, Post Graduate section, Presidency College, Calcutta, India (during 1997-98).

(c) **Experience related to Chemical Education:**

I have designed and developed a Physical Chemistry experiment on “Determination of the Critical Micellar Concentration (CMC) of a Cationic Micelle CTAB Fluorometrically from Stokes Shift data: A Laboratory Experiment”; this article was accepted for publication in *The Chemical Educator* (2007). This is a new method for the determination of CMC spectroscopically, and the experiment described here has been adopted as a laboratory experiment for senior undergraduates in Chemistry Department at the Iowa State University from spring 2005.

7. **Related Professional Experiences:**

Extensive experience in electronics design and instrumentation involving Lasers, Fluorimeters,

Spectrophotometers, Gas chromatograph, etc. Experienced in fabrication of setup like Laser Flash Photolysis – Magnetic Field apparatus (during Ph. D. work), designing and setting up of femtosecond coherence setup (involving Ti-Sapphire laser system), fluorescence upconversion apparatus, picosecond absorption (including optical parametric amplifier) apparatus, apparatus for time-correlated single photon counting, etc.

8. **Awards:**

1. Sadhan Basu Memorial Award for Topper in M. Sc. (Chemistry) Exam, 1995 under University of Calcutta.
2. The ODS/NIEHS Training Fellowship for the Individual Research Fellows. The sponsors are the Office of Dietary Supplements (ODS) and the National Institutes of Environmental Health Sciences (NIEHS), USA.

Title of the Individual Project: "Photophysics of Hypericin: Interactions with Glutathione S-Transferase".

8. **List of publications:**

(a). **Papers Published in Journals:**

- (1) Magnetically Sensitive non-polar exciplex: the perfluoronaphthalene – anthracene system; A. Misra, R. Dutta, **Mintu Haldar**, M. Chowdhury, *Chem. Phys. Letts.* 281 (1997) 254-260.
- (2) Molecular recognition: Hydrogen bonding induced configurational locking of a new photoresponsive receptor by dicarboxylic acids; S. Goswami, K. Ghosh, **Mintu Halder**; *Tet. Letts.* 40 (1999) 1735-1738.
- (3) Magnetic field effect on photoinduced electron transfer reaction between $[\text{Ru}(\text{bpy})_2(\text{H}_3\text{pzbzim})]^{2+}$ and N,N'-methylviologen in micellar solution: A laser flash photolytic study in high fields; A. Misra, **Mintu Haldar**, M. Chowdhury; *Res. Chem. Intermed.* 25 (1999) 813-826.
- (4) Inversion in magnetic field effect of benzilketyl : SDS radical pair at high fields; A. Misra, **Mintu Haldar**, M. Chowdhury; *Chem. Phys. Letts.* 305 (1999) 63-70.
- (5) Magnetic field effect on the micellar $(\text{C}_{60})_n^{\bullet-}$ -pyrene $^{\bullet+}$ radical-pair system; **Mintu Haldar**, A. Misra, A. K. Banerjee, M. Chowdhury; *J. Photochem. Photobiol. A.* 127 (1999) 7-12.
- (6) Magnetic field effect on the micellar surface bound benzophenone tetracarboxylic acid-sodium salt in aqueous cetyltrimethyl ammonium bromide medium; **Mintu Haldar**, M. Chowdhury, *Chem. Phys. Letts.* 312 (1999) 432-439.
- (7) Large magnetic-field effect on the radical pair generated from the photo-induced electron transfer from skatole to 2,4,6-triphenyl pyrilium tetrafluoroborate in aqueous SDS micellar medium, **Mintu Haldar**, M. Chowdhury; *Chem. Phys. Letts.* 319 (2000) 349-354.
- (8) Magnetic-field effect in Chemistry – The Indian Scenerio; S. Basu, **Mintu Haldar**, M.

- Chowdhury, *Proc. of Ind. Acad. of Sc.* 66A (2000) 267-288.
- (9) Spectral assignment of dual conformers of 1,2,3,6,7,8-hexahydropyrene in supersonic jet; A. Chakraborty, D. Nath, **Mintu Halder**, N. Guchhait, M. Chowdhury; *J. Chem. Phys.* 114 (2001) 865-875.
- (10) Large magnetic field effect on the back electron transfer from uncharged radical to its cationic partner in anionic micelle; P. P. Parui, **Mintu Halder**, K. R. Gopidas, D. N. Nath, M. Chowdhury; *Molecular Physics* 100 (2002) 2895-2901.
- (11) Magnetic Field Control of the Back-Electron-Transfer Process Following Photoinduced Electron Transfer (PIET) in Biphenyl/ Phenylpyrylium Salts in SDS Micellar Medium; **Mintu Halder**, P. P. Parui, K. R. Gopidas, D. N. Nath, M. Chowdhury; *J. Phys. Chem. A.* 106 (2002) 2200-2206.
- (12) Micellar confinement of charged donor-acceptor system: a case of large MFE; **Mintu Halder**, P. P. Parui, K. R. Gopidas, D. N. Nath, M. Chowdhury; *RIKEN Review* 44 (2002) 53-55.
- (13) A Comparative Femtosecond Coherence Study of the Unligated Monomeric Heme proteins Myoglobin and Leghemoglobin; **Mintu Halder**, K. Das, P. K. Chowdhury, S. Kundu, M. S. Hargrove, J. W. Petrich; *J. Phys. Chem. B.* 107 (2003) 9933-9938.
- (14) Effects of Distal Pocket Mutations on the Geminate Recombination of NO with Leghemoglobin on the Picosecond Time Scale ; P. K. Chowdhury, S. Kundu, **Mintu Halder**, K. Das, M. S. Hargrove, J. W. Petrich, *J. Phys. Chem. B.* 107 (2003) 9122-9127.
- (15) Generation of Fluorescent Adducts of Malondialdehyde and Amino Acids: Towards an Understanding of Lipofuscin; P. K. Chowdhury, **Mintu Halder**, P. K. Choudhury, G. A. Kraus, M. J. Desai, D. W. Armstrong, T. A. Casey, M. A. Rasmussen, J. W. Petrich; *Photochem. Photobiol.* 79 (2004) 21-25.
- (16) Adsorption of trivalent lanthanides on the SDS micellar interface; **Mintu Halder***, D. N. Nath; *Chem. Phys. Letts.* 387 (2004) 81-84
- (17) The Complex of Apomyoglobin with the Fluorescent Dye, Coumarin 153 ; P. K. Chowdhury, **Mintu Halder**, L. Sanders, R. A. Arnold, Y. Liu, D. W. Armstrong, S. Kundu, M. S. Hargrove, X. Song, J. W. Petrich; *Photochem. Photobiol.* 79 (2004) 440-446.
- (18) Dynamic Solvation in Room Temperature Ionic Liquids; P. K. Chowdhury, **Mintu Halder**, L. Sanders, T. Calhoun, J. L. Anderson, D. W. Armstrong, X. Song, J. W. Petrich; *J. Phys. Chem. B.* 108 (2004) 10245-10255.
- (19) A Comparative study of large magnetic field effect on the radical pair generated by the photo-induced electron transfer from indoles to 2,4,6-triphenyl pyrylium tetrafluoroborate and its thia-analogue in aqueous SDS micellar medium; **Mintu Halder***, *Chem. Phys.* 303 (2004) 243-253
- (20) Hypericin and its perylene quinone analogs: Probing structure, dynamics, and interactions with the environment; **Mintu Halder**, P. K. Chowdhury, M. S. Gordon, J. W. Petrich, K. Das, J. Park, Y. Alexeev; *Adv. Photochem.* Vol-28, p 1-26 (2005).
- (21) The Separation of Hypericin's Enantiomers and Their Photophysics in Chiral Environments, L. Sanders, **Mintu Halder**, T. L. Xiao, J. Ding, D. W. Armstrong, J. W. Petrich ; *Photochem. Photobiol.* 81 (2005) 183-186
- (22) Interaction of Glutathione S-Transferase with Hypericin: A Photophysical Study; **Mintu Halder**; P. K. Chowdhury, R. Das, P. Mukherjee, W. M. Atkins, J. W. Petrich, *J. Phys. Chem. B.* 109 (2005) 19484-19489.

- (23) Synthesis of hydroxy and methoxy perylene quinones, their spectroscopic and computational characterization, and their antiviral activity; G. Krishnamoorthy, S. Webb, T. Nguyen, P. K. Chowdhury, **Mintu Halder**, N. J. Wills, S. Carpenter, G. A. Kraus, M.S. Gordon, J. W. Petrich; *Photochem. Photobiol.* 81 (2005) 924-933.
- (24) Maristentorin, a Novel Pigment from the Positively Phototactic Marine Ciliate *Maristentor dinoferus*, Is Structurally Related to Hypericin and Stentorin; P. Mukherjee, P.; D. B. Fulton; **Mintu Halder**, X. Han, D. W. Armstrong, J. W. Petrich, C. S. Lobban; *J. Phys. Chem. B.* 110 (2006) 6359-6364.
- (25) Experimental and Theoretical Investigations of Solvation Dynamics of Ionic Fluids: Appropriateness of Dielectric Theory and the Role of DC Conductivity; **Mintu Halder**; Headley, L. S.; Mukherjee, P.; Song, X.; Petrich, J. W.; *J. Phys. Chem. A.* 110 (2006) 8623-8626.
- (26) Dynamic Solvation in Imidazolium-Based Ionic Liquids on Short Time Scales; Lindsay Sanders Headley, Prasun Mukherjee, Jared L. Anderson, Rongfang Ding, **Mintu Halder**, Daniel W. Armstrong, Xueyu Song, and Jacob W. Petrich; *J. Phys. Chem. A.* 110 (2006) 9549-9554.
- (27) Assessing the Roles of the Constituents of Ionic Liquids in Dynamic Solvation: Comparison of an Ionic Liquid in Micellar and Bulk Form; Prasun Mukherjee, Jeffrey A. Crank, **Mintu Halder**, Daniel W. Armstrong, Jacob W. Petrich; *J. Phys. Chem. A.* 110 (2006) 10725-10730.
- (28) Characterization of the Interactions of Fluorescent Probes with Proteins: Coumarin 153 and 1,8-ANS in complex with Holo- and Apomyoglobin; Prasun Mukherjee, **Mintu Halder**, Mark S. Hargrove, Jacob W. Petrich; *Photochem. PhotoBiol.* 82 (2006) 1586-90
- (29) Determination of the Critical Micellar Concentration (CMC) of a Cationic Micelle from Stokes Shift data; **Mintu Halder**; *The Chemical Educator* 12 (2007) 33-36
- (30) Solvation dynamics in protein environments: Comparison of fluorescence upconversion measurements of coumarin 153 in monomeric hemeproteins with molecular dynamics simulations; **Mintu Halder**, P. Mukherjee, S. Bose, M. S. Hargrove, X. Song, J. W. Petrich; *J. Chem. Phys.* 127 (2007) 055101 -6
- (31) Accumulation and Interaction of Hypericin in Low-density Lipoprotein- A Photophysical Study; P. Mukherjee, Ramkrishna Adhikary, **Mintu Halder**, J. W. Petrich, P. Miskovsky; *Photochem Photobiol.* 84 (2007) 706-12
- (32) Application of the Reorganization energy in the Determination of Critical Micellar concentration of a Micelle; P. Bolel, **Mintu Halder**, *ISRAPS Bulletin* 20 (2008) 8-14
- (33) Fluorescence quenching of carmoisine by viologens in neat methanol: Observation of inversion in quenching; P. Bolel, **Mintu Halder**, *Chem. Phys. Letts.* 507 (2011) 234-39
- (34) Optical Spectroscopic Exploration of Binding of Cochineal Red A with Two Homologous serum Albumins; P. Bolel, N. Mahapatra, **Mintu Halder**, *J. Agric. Food Chem.* 60 (2012) 3727-3734.
- (35) Spectroscopic Investigation of the Effect of Salt on Binding of Tartrazine with Two Homologous Serum Albumins: Quantification by Use of the Debye–Hückel Limiting Law and Observation of Enthalpy–Entropy Compensation; P. Bolel, S. Datta, N. Mahapatra, **Mintu Halder**, *J. Phys. Chem. B.* 116 (2012) 10195–10204.

- (36) Modulation of Accessibility of Subdomain IB in the pH-Dependent Interaction of Bovine Serum Albumin with Cochineal Red A: A Combined View from Spectroscopy and Docking Simulations; P. Bolel, N. Mahapatra, S. Datta, **Mintu Halder**, *J. Agric. Food Chem.* 61 (2013) 4606-4613.
- (37) pH-insensitive electrostatic interaction of carmoisine with two serum proteins: A possible caution on its uses in food and pharmaceutical industry; S. Datta, N. Mahapatra, **Mintu Halder**; *J. Photochemistry Photobiology, B: Biology*, 124 (2013) 50-62
- (38) Effect of encapsulation in the anion receptor pocket of sub-domain IIA of human serum albumin on the modulation of pK_a of warfarin and structurally similar acidic guests: A possible implication on biological activity; S. Datta, **Mintu Halder**, *J. Photochemistry Photobiology, B: Biology*, 130 (2014) 76-85 (Highlighted in Nature-India).
- (39) A new spectroscopic protocol for selective detection of water soluble sulfides and cyanides: Use of Ag-nanoparticles synthesized by Ag(I)-reduction via photo-degradation of azo-food-colorants; N. Mahapatra, S. Datta, **Mintu Halder**, *J. Photochemistry Photobiology, A: Chemistry*, 275 (2014) 72-80
- (40) Exploration of pH-dependent behavior of the anion receptor pocket of subdomain IIA of HSA: Determination of effective pocket charge using the Debye- Hückel Limiting law; P. Bolel, S. Datta, N. Mahapatra, **Mintu Halder**, *J. Phys. Chem. B*, 118 (2014) 26–36
- (41) Facile reversible LSPR tuning through additive-induced self-aggregation and dissemination of Ag NPs: Role of cyclodextrins and surfactants; N. Mahapatra, **Mintu Halder**, *RSC Advances*, 4 (2014) 18724-18730.
- (42) Detailed Scrutiny of the Anion Receptor Pocket in Subdomain IIA of Serum Proteins toward Individual Response to Specific Ligands: HSA-Pocket Resembles Flexible Biological Slide-Wrench Unlike BSA; S. Datta, **Mintu Halder**, *J. Phys. Chem. B*, 118 (2014) 6071-6085.
- (43) Single source-precursor route for the one-pot synthesis of highly luminescent CdS QDs for ultra-sensitive and selective photoluminescence sensor for Co^{2+} and Ni^{2+} ions; N. Mahapatra, S. Panja, A. Mandal, **Mintu Halder**; *J. Mater. Chem: C*, 2 (2014) 7373-7384.
- (44) Detailed Scenario of the Acid-Base Behavior of Prototropic Molecules in the Subdomain-IIA Pocket of Serum Albumin: Results and Prospects in Drug Deliver; S. Datta, S. Panja, **Mintu Halder**; *J. Phys. Chem. B*, 118 (2014) 12153–12167.
- (45) Synthesis of a new class of furo [3,2-c] coumarins and its anticancer activity; M. Rajabi, Z. Hossaini, M. A. Khalilzadeh, S. Datta, **Mintu Halder**, S. A. Mousa, *J. Photochemistry Photobiology, B: Biology*, 148 (2015) 66-72.
- (46) Distilbene Derivative as a New Environment-Sensitive Bifunctional Ligand for the Possible Induction of Serum Protein Aggregation: A Spectroscopic Investigation and Potential Consequences; S. Datta, S. Panja, P. Mitra, **Mintu Halder**, *Langmuir*, 31 (2015) 10781-10790. (Highlighted in Nature-India).
- (47) Effect of Ligand Binding-Induced Secondary Structure Alteration on the Mode of Interaction in Exogenous Ligand Binding: A Biophysical Investigation of Binding of Tartrazine in the hydrophobic Pocket of Human Lysozyme and Chicken Egg White Lysozyme; S. Panja, **Mintu Halder** (Submitted, 2015)
- (48) Reorganization Energy and Stokes Shift Calculations from Spectral Data as New Efficient Approaches in Distinguishing the End Point of Micellization/Aggregation; **Mintu Halder**, S.

Datta, P. Bolel, N. Mahapatra, S. Panja, H. Vardhan, S. Kayal, D. Khatua, I. Das; *Analytical Methods, RSC* (Accepted Feb 2016)

(b) Conference Papers:

- (1) Magnetic field effect on photoinduced electron transfer between $[\text{Ru}(\text{bpy})_2(\text{H}_3\text{pzbzim})]^{2+}$ and N,N'-methylviologen in micellar solution: A laser flash photolytic study at high fields; A. Misra, **Mintu Haldar**, M. Chowdhury.

Presented at: First National Symposium in Chemistry organized by Chemical Research Society of India, Indian Institute of Science, Bangalore, India, 1999.

- (2) Large magnetic-field effect on the radical pair generated from the photo-induced electron transfer between skatole to 2,4,6-triphenyl pyrylium tetrafluoroborate in aqueous SDS micellar solution; **Mintu Haldar**, M. Chowdhury.

Presented at: Symposium on Recent Trends in Photochemical Sciences, Regional Research Laboratory, Trivandrum, India, 2001.

- (3) Solvation dynamics in protein environments; X. S. Song, P. K. Chowdhury, **Mintu Halder**, J. W. Petrich; 226th ACS National Meeting, New York, USA, September 7-11, 2003.

- (4) Ligand Binding in the Sub-domain IIA of Serum Proteins: Some Unobvious Consequences; **Mintu Halder**, Advances in Spectroscopy and Ultrafast Dynamics, IACS, Kolkata, December 12-14, 2014.

Dr Mintu Halder

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