



Dear Colleagues and friends,



We consider it a great privilege to be able to bring to you the first issue of the Newsletter being published on behalf of the Indian Society for Surface Science and Technology. As members of the organization we understand that publishing a newsletter has been a long unrealized mission of the society. It is really a happy occasion that this mission has become a reality. Both of us are grateful to some of the senior members of the society who assigned us this responsibility and provided us the necessary support as and when required.

We hope to bring the Newsletter at regular intervals, and request you to actively participate through suggestions and inputs for its improvement. If you have any opinion about this newsletter or its content, we request you to contact us by the e-mail at the addresses given at the top of the newsletter.

With warm regards,

**Dr. Saurabh Das & Dr. Atanu Mitra,
Joint Editors.**

Dear Fellow Members,



It gives me immense pleasure to place before you this news letter which is being published for the first time by our Society. Indian Society for Surface science and Technology, has taken up this endeavour as a tool to continuously communicate with you, fellow members, as well as to provide you with interesting information on surface science. It will also be our endeavour to keep you posted about the achievements of the society members including their publications. The editors worked hard, did put in a lot of time and have done a tremendous job in compiling this news letter. I must congratulate the editors as well as all those who helped including the society's executive committee members, in making this venture a success. I also request you, fellow members, to provide us with your opinion and suggestions. Your feed back will be very useful for making each issue of the news letter, probably two in each calendar year, better than the previous one. Best wishes to all of you.

A.K. Rakshit, President

About the Society

The Indian Society for Surface Science and Technology (ISSST) was established in October, 1983 as an outcome of the first National Conference on Surfactants, Emulsions and Biocolloids (NATCOSEB) at Jadavpur University, Kolkata. Scientists who assembled at this

meet from academia and industries felt the need for a common platform to deliver, discuss and exchange experiences and knowledge in the field of colloid and surface science for their mutual benefit, and benefit to the country at large. The Society was formed under the leadership of Prof. S. K. Mukherjee, Prof. M. M. Chakraborty, Prof. S. Aditya, Prof. D. K. Chattoraj, Prof. S. P. Moulik, and guidance of many others. Since its inception, the Society has been regularly organizing International Conferences, National conferences (NATCOSEB), workshops and one day seminars.

Since 1985, the society has been publishing an International Journal, *Journal of Surface Science and Technology*, the first of its kind in the country that is now quite popular and abstracted by the Chemical Abstract Services, USA, the British Library, "Scopus" and other national and international data bases. It has also published a book, entitled *Liquid Membrane Phenomena Biological Implications* by late Prof. R. C. Srivastava, a former life member of the Society.

The society has at present close to six hundred (~ 600) life members including overseas members from countries like the USA, Canada, Germany, Japan etc. Besides the headquarters at Kolkata, the society has a Western India chapter at Mumbai. It cordially welcomes interested scientists and young researchers for their enrollment into its fold. The details are available at the society website, www.issstindian.org. It has a mission to generate awareness for strengthening infrastructure for the cultivation of the field of Colloid and Surface Science in India both with regard to teaching and research. It is now a proven fact that this branch of science has immense importance and potential for growth. It has applications in the fields of chemistry, physics, pharmacy, biology, especially nanoscience and related technologies as well as in multiple other uses in our day-to-day life.

India's Contribution in Surface Science:

The scenario then and now

Research in classical colloid and surface science in India was initiated by the pioneers like J. N. Mukherjee, J. C. Ghosh, B. N. Ghosh, S. S. Bhatnagar, B. R. Puri, S. Ghosh and others. They made significant contributions in the areas of colloidal stability, especially on the preparation and coagulation of colloids by electrolytes, electrokinetic behaviours (with special reference to electro-osmosis and electrophoresis) of colloids and biocolloids, kinetics of coagulation, gelation, electrochemical properties of sols and dispersions, adsorption of gases on dispersed solid surfaces and in their pores, etc. Over the last five decades there has been significant contributions in the field of surface chemistry, specially on the micelles, reverse

micelles, emulsions, microemulsions, polymer (also biopolymer)- surfactant interactions, electrofiltration, phase behaviours, liposomes, vesicles, drug encapsulation and delivery, nanostructured materials, and other related areas from different Universities and Institutes of India

Membership

The society cordially welcomes interested scientists and young researchers to join the ISSST as members. Details are available at the website, www.issstindian.org.

Life membership: Rs. 3000/- **Annual membership:** Rs. 300/-

Conferences organized by ISSST

NATCOSEB (*National Conference on Surfactants, Emulsions and Biocolloids*)

This is the flagship conference of the society held every alternate year since the establishment of the society in 1983. These were held at various parts of the country as detailed below. The last conference was held at CLRI, Chennai during November 2013.

1983	NATCOSEB(I)	JU, Kolkata
1985	NATCOSEB(II)	IIT, New Delhi
1987	NATCOSEB(III)	AMU, Aligarh
1989	NATCOSEB(IV)	IIT, Mumbai
1991	NATCOSEB(V)	MSU, Baroda
1994	NATCOSEB(VI)	CLRI, Madras
1995	NATCOSEB(VII)	Visva-Bharati, Santiniketan
1997	NATCOSEB(VIII)	SU, Sambalpur
1999	NATCOSEB(IX)	KU, Kalyani
2001	NATCOSEB(X)	NEHU, Shillong
2003	NATCOSEB(XI)	UCIT, Mumbai
2005	NATCOSEB(XII)	MU, Imphal
2007	NATCOSEB(XIII)	BITS, Pilani
2009	NATCOSEB(XIV)	KU, Srinagar
2011	NATCOSEB(XV)	TU, Agartala
2013	NATCOSEB(XVI)	CSIR-CLRI, Chennai



TSSRA (*Trends in Surface Science and Related Areas*)

For several years now (since 2006), ISSST has started an yearly one day conference with the title TSSRA. This is being held with the hope that young research students would be able to present their work in the presence of their seniors and teachers and also be able to know about the research work being held in and around Kolkata. It has been organized most often at Jadavpur University but has also been held at the Scottish Church College, Kolkata and the Presidency University, Kolkata. Owing to the financial constraint, the society has not ventured beyond the Kolkata area. However, the society would be gladly willing to go beyond Kolkata, if some institutions come forward for collaboration.

The last edition of TSSRA was held at Presidency University in the month of July, 2014. Prof. B. Das of the Department of Chemistry (PU) was the Convener. Seven lectures were delivered by senior professors as well as young researchers from academy and industry. An important feature of the last TSSRA was the interactive session that was introduced for the first time where undergraduate and postgraduate students interacted enthusiastically with the experts in surface science. Around 130 participants of different disciplines from Kolkata and the rest of West Bengal had gathered on this occasion.

The next TSSRA we are planning to hold this year at Science College, Calcutta University.

North East Regional Seminar on Trends in Colloid and Interface Science (*NERSTCIS-2014*)

The society also collaborated with the chemistry department of North east Hill University in organizing NERSTCIS-2014 at Shillong on Nov. 27-28, 2014 with Prof. K. Ismail as convener. There were more than 100 participants in the conference where besides a key note lecture, two special lectures, 13 invited lectures and around 30 papers were presented on various aspects of

surface science. Research students were encouraged with prizes for their presentations.

Awards Given by Society

i) B. N. Ghosh Memorial Award (2013 Awardee: Prof. K. Bhattacharyya, IACS, Kolkata), ii) Dr. Syamasri Gupta Memorial Award (2013 Awardee: Dr. T. Bala, CU, Kolkata), iii) Award for the best paper published in JSST in between two NATCOSEBs, iv) Best Oral and Poster Presentation Awards in NATCOSEB.

The Journal: The Journal of Surface Science and Technology



Started in 1985 the journal has an International Advisory Board since 1988. Till 2014, 30 volumes of the journal have been published. The scope of the journal and related information can be obtained from the website of the society: www.issstindian.org

Papers published in JSST Vol 30, Issue No. 1-2

1. Molecular basis of the binding of dye to polycations: Absorption and emission spectral studies. M. Chakraborty and A.K. Panda. pp. 1-16.
2. Crack formation on a drying droplet in the presence of static electric field. T. Khatun, T. Dutta, and S. Tarafdar. pp. 17-33
3. Effect of feed rate and impact angle on the erosive wear of high velocity oxyfuel sprayed coating under high temperature conditions. S. Sharma. pp. 35-43
4. An effective heterogeneous catalyst from waste material for the biodiesel production. A. Arora, S. Raj M.P, T. Mandal, J. Cristopher, S.K. Puri, A.A. Gupta. pp. 45-48
5. Shampoos then and now: Synthetic versus natural now stearic acid. A. Pradhan and A. Bhattacharya. pp. 59-76
6. Characterization of DNA-protein complex ionogels using small angle neutron scattering, differential scanning calorimetry and rheology. K. Rawat. pp. 77-91.

Papers published in JSST Vol 30, Issue No. 3-4

1. Surface properties of Amphiphilic Drugs in presence of cationic surfactants. T. Yadav, D. Tikariha, J. Lakra, A. K. Tiwari, S. K. Saha and K. K. Ghosh. pp. 93-110.
2. Evaluation of ingredient effects on friction brake shoe composite using Taguchi method. Jamasri, V. Malau, M. N. Ilman and E. Surojo. pp. 111-128.

3. Molecular imprinted polymers as synthetic receptors for the analysis of Testosterone. A. Augustine and B. Mathew. pp. 129-148.

4. Cyclic voltammetric determination of Acetyl-salicylic acid (Aspirin) at polyaniline (PANI) modified glassy carbon electrode. pp. 149-161.

5. Montmorillonite K10: An effective adsorbent for removal of a toxic reactive mono-azo dye, Procion Red MX 5B, from water. G. K. Sarma, S. Sengupta and K. G. Bhattacharyya. pp. 163-178.

6. Effects of acid treatment on surface characteristics of the oxides, CoO, MnO₂ and ZnO. M. Das, K. G. Bhattacharyya. pp. 179-200.

Eminent Surface Scientists

In this column we will be presenting a short biography of an eminent surface scientist either from India or abroad. In this issue we are proud to present the life and the work of Prof. J. N. Mukherjee of the University of Calcutta.



Prof. J. N. Mukherjee

(23rd April, 1893 – 10th May, 1983).

An M.Sc of University of Calcutta, and D.Sc. of University of London, Prof. Mukherjee had specialized in Electrochemistry, Colloids and Soil Science. He was a Professor of Chemistry (University of Calcutta), Director, Indian Agricultural Research Institute (New Delhi), Founder/Director, Central Building Research Institute (Roorkee), Administrator, Board of Secondary Education (West Bengal), Member, Union Public Service Commission.

He made significant pioneering studies on the electrochemistry of colloids, electrokinetic phenomena and the physicochemical concept of electrical double layer. His profound interest in the soil science with special reference to the agriculture was well known. Preparation of the soil map of the country through extensive soil survey was one of his remarkable contributions for the agricultural development in India. He was responsible for the foundation of the Indian National Science Academy and was associated with the Indian Science Congress Association. Besides, he was associated with many other policy making and technical committees of the country.

Janendra Nath Mukherjee received many honors and awards as listed below: Fellow of Indian National Science Academy, Indian Academy of Science and Royal Society of Chemistry (London). Founder Secretary of the Indian Chemical Society; President of Indian Society of Soil Science; Vice-President and Secretary of Indian National Science Academy

(INSA) and President, Indian Science Congress Association

A list of forthcoming national and international conferences

- i) Conference of the International Association of Colloid and Interface Scientists (IACIS-2015), 24 – 29 May, 2015, Mainz, Germany.
- ii) 89th American Chemical Society Colloid and Surface Science Symposium (CSSS15), 15 – 17 June, 2015, Pittsburgh, PA, USA.
- iii) 5th International Colloids Conference (COLL15), 21 – 24 June, 2015, Amsterdam, Netherlands
- iv) European Aerosol Conference (EAC), 06 – 11 September, 2015, Milan, Italy.
- v) NATCOSEB (XVII), 4 – 6 November, 2015, Pandit Ravisankar Shukla University, Raipur, India.
- vi) 6th Asian Conference on Colloid and Interface Science, November 25-27, 2015, Arkas Sasebo, Sasebo, Japan.

Few Recent Publications of ISSST Members

1. Effect of ionic liquids on microstructures of micellar aggregates –formed by PEO-PPO-PEO block copolymer in aqueous solution. R.L. Vekariya, D. Ray, V.K. Aswal, P.A. Hassan., *Colloids and Surfaces A. Physicochemical and Engineering Aspects.*, 462, **2014**, 153
2. Rheological behaviour of nanocellulose reinforced unsaturated polyester nanocomposites. C.J. Chirayil, L. Mathew, P.A. Hassan, M. Mozetic, S. Tomas., *International Journal of Biological Macromolecules.*, 69, **2014**, 274
3. Binding of phenol red to cetylpyridinium chloride at air-solution and micelle-solution interfaces in aqueous ethylene glycol media. A. Srivastava, K. Ismail., *Colloids and Surfaces A. Physicochemical and Engineering Aspects.*, 462, **2014**, 115
4. Pyrimidine-based fluorescent zinc sensor: Photo-physical characteristics, quantum chemical interpretation and application in real samples. S.S. Mati, S. Chall, S. Konar, S. Rakshit, S.C. Bhattacharya., *Sensors and Actuators B, Chemical.*, 201, **2014**, 204
5. A simple but highly selective and sensitive fluorescence reporter for toxic Cd-II ion via excimer formation. A. Samanta, N. Guchhait, S.C. Bhattacharya., *Chemical Physics Letters.*, 612, **2014**, 251
6. Influence of aquo-organic solvent media on the self-aggregation of sodium dodecyl sulfate (SDS) and its interaction with polyvinylpyrrolidone (PVP). B. Mandal, S.P. Moulik, S. Ghosh., *Colloid and Polymer Science.*, 292, **2014**, 2485
7. Biosorption of trivalent chromium from waste water: An approach towards green chemistry. J. Kanagaraj, T. Senthilvelan, R.C. Panda, R. Aravindhan, A.B. Mandal., *Chemical Engineering and Technology.*, 37, **2014**, 1741
8. 1,1,1,3,3,3-Hexafluoro-2-propanol and 2,2,2-trifluoroethanol solvents induce self-assembly with different surface morphology in an aromatic dipeptide. S.M.M. Reddy, G. Shanmugam, A.B. Mandal., *Organic and Biomolecular chemistry.*, 12, **2014**, 6181

9. Aspect Ratio dependent cytotoxicity and antimicrobial properties of nanoclay. K. Rawat, S. Agarwal, A. Tyagi, A. K. Verma, H. B. Bohidar., *Applied Biochemistry and Biotechnology*, 174, **2014**, 936.

10. Hierarchical surface charge dependent phase states of gelatin-bovine serum albumin dispersions close to their common PI. P. Jyotsana, K. Rawat, V.K. Aswal., *Journal of Physical Chemistry B.*, 118, **2014**, 11161.

11. Assessment of antidotal efficacy of cholinesterase reactivators against paraoxon: In vitro reactivation kinetics and physicochemical properties. G. Bhanushree, N. Singh, R. Sham., *Bioorganic and medicinal chemistry letters.*, 24, **2014**, 4743.

12. Catalytic hydrolysis of phosphodiester by nucleophilic ions in Gemini micellar media. K. Birendra, D. Tikariha, M.L. Satnami, *Journal of Physical Organic Chemistry.*, 27, **2014**, 613.

13. Monolayer characteristics of chitosan assembled in langmuir films mixed with arachidic acid . J. Nath, R.K. Nath, A. Chakraborty, *Surface Review and Letters.*, 21, **2014**,

14. Physicochemical behaviors of cationic Gemini surfactant (14-4-14) based microheterogeneous assemblies. S. Das, I. Mukherjee, B.K. Paul., *Langmuir.*, 30, **2014**, 12483

15. Pyrene-based fluorescent supramolecular hydrogel: Scaffold for energy transfer. S. Mukherjee, T. Kar, P.K. Das., *Chemistry-An Asian Journal.*, 9, **2014**, 2798

16. Biocompatible nanocrystalline natural bonelike carbonated hydroxyapatite synthesized by mechanical alloying in a record minimum time. S. Lala, S. Brahmachari, P.K. Das, D. Das, T. Kar, S. K. Pradhan. *Materials Science and Engineering C*, 42, **2014**, 647

17. Interaction of cyclodextrins with human and bovine serum albumin: A combined spectroscopic and computational investigation. S. Ghosh, B.K. Paul, N. Chattopadhyay. *Journal of Chemical Sciences.*, 126, **2014**, 931

18. Interaction of beta-cyclodextrin with Nile red in a single live CHO cell: An initiative towards developing a prospective strategy for the excretion of adsorbed drugs from the cell membrane. S. Ghosh, S. Chattoraj, N. Chattopadhyay., *Analyst.*, 139, **2014**, 5664

19. Effect of salt additives on the aggregation behaviour and morphology of 14-E2-14. Y. Sabreena, A. Mohd, Kabir-ud-Din. *Colloids and Surfaces A, Physicochemical and Engineering Aspects.*, 463, **2014**, 8

20. Impairing effect of fibrinogen on the mono-/bi-layer form of bovine lung surfactant. R. Devraj, K. Nag, P. Nahak. *Colloid and Polymer Science.*, 292, **2014**, 2765

21. A study on biochemical changes during cultivation of *Rhizopus oryzae* in deproteinized whey medium in relation to chitosan production. S. Chatterjee, A.K. Guha., *Letters in Applied Microbiology.*, 59, **2014**, 155

22. Coiling/uncoiling behaviour of sodium polystyrene sulfonate in 2-ethoxyethanol–water mixed solvent media as probed using viscometry. R. Dey, B. Das., *Polymer International.*, 63, **2014**, 1959

23. Influence of sodium carboxymethylcellulose on the aggregation behavior of aqueous 1-hexadecyl-3-methylimidazolium chloride solutions. B. Das, D. Ray, R. De, *Carbohydrate Polymers*, 113, **2014**, 208

24. Electrochemical and chromogenic sensors based on ferrocene appended chalcone for selective quantification of Copper (II). A. Kamal, K. Kumar, V. Kumar, *Electrochimica Acta.*, 145, **2014**, 307
25. Dynamic interfacial behaviour of poly(oxyethylene) Lauryl ether based surfactant mixture, A. Goswami, V. Gunjan, P.A. Hassan, V.K. aswal, S.S. Bhagat. *Journal of Dispersion science and Technology.* 35, **2014**, 1717
26. Strong crystal field effect and efficient phonon assisted Yb³⁺ to Tm³⁺ energy transfer in a (Yb³⁺/Tm³⁺) co-doped high Barium-tellurite glass, S. Bose and R. Debnath., *Journal of Luminescence.*, 155, **2014**, 210
27. A comprehensive phononics of phonon assisted energy transfer in the Yb³⁺ aided upconversion luminescence of Tm³⁺ and Ho³⁺ in solids. R. Debnath and S. Bose, *J. Lumin.*, 2015. DOI: 10.1016/J.Lumin.2014.12.045.
28. Synthesis, crystal structure, DNA interaction and *in vitro* anticancer activity of a Cu(II) complex of purpurin: dual poison for human DNA topoisomerase I and II. P. Das, C. K. Jain, S. K. Dev, R. Saha, A. D. Chowdhury, S. Roychoudhury, S. Kumar, H. K. Majumder, S. Das., *RSC Advances*, 3, **2014**, 59344.
29. A study on the formation of the nitro radical anion by ornidazole and its significant decrease in a structurally characterized binuclear Cu(II)-complex: impact in biology. R.C. Santra, D. Ganguly, J. Singh, K. Mukhopadhyay and S. Das, *Dalton Transactions*, 44, **2015**, 1992
30. Physico-chemical studies on the interaction of dendrimers with lipid bilayers. I. Effect of dendrimer generation and liposome surface charge. B. Roy, A.K. Panda, S. Parimi, I. Ametov, T. Barnes, C.A. Prestidge., *J. Oleo Science*, 63, **2014**, 1185
31. Interfacial and micellar properties of mixed systems of tricyclic antidepressant drugs with polyoxyethylene alkyl ether surfactants. R. Sharma, N. Durgesh, R.K. Mahajan., *Colloids and Surfaces A. Physicochemical and Engineering Aspects.*, 451, **2014**, 107
32. pH controlled size/shape in CTAB micelles with solubilized polar additives: A viscometric, scattering and spectral evaluation.. V. Patel, N. Dharaiva, D. Rav. *Colloids and Surfaces A. Physicochemical and Engineering Aspects*, 455, **2014**, 67
33. New amido-amine compound used as surfactants, antimicrobial agents, emulsifiers, solubilizing agents, foaming and dispersing agents and used in compositions for fabric conditioning.. A.K. Ghumare, S.S. Bhagwat. *Inst chem technology (CHTE-Non standard)*, Patent No. IN201002393-13
34. Effect of Gemini(alkanedivl-alpha, omega-bis (dimethylcetylammmonium bromide)(16-s-16, s=4,5,6) surfactants on the interaction of ninhydrin with chromium- α -glutylphenylalanine. D. Kumar, A.M. Rub, M. Akram., *Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy*, 132, **2014**, 294
35. Micellization of cetyltrimethylammonium bromide: effect of small chain Bola electrolytes. A. Pan, P. Sil, S. Dutta, P. K. Das, S. C. Bhattacharva, A. K. Rakshit, V. K. Aswal and S. P. Moulik, *J. Phys. Chem. B*, 118, **2014**, 3041.

NB. Members are requested to send a list of their publication with complete reference that would be published between March and August, 2015 or any other suggestions.