

This issue is dedicated to Prof. Gurmeet Singh
and Dr. (Mrs) Gurmeet Kaur

BIOGRAPHY OF PROF. GURMEET SINGH



PROF. GURMEET SINGH

Ph.D., Delhi University

Fellow – S.A.E.S.T. (India)

Governing Council Member – S.A.E.S.T. (India)

Fellow – The Electrochemistry Society of India

Former Proctor, University of Delhi (India)

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Professor Gurmeet Singh has been in the University for last 33 years. His research interests are in the field of Corrosion Chemistry, Inhibitor Formulations, Surface Characterization and Nano Film Deposition. He has got 43 Ph. D and 14 M. Phil students to his credit. He has published around 100 research papers and has contributed articles in many books. He was given the best research paper award by the Electrochemical Society of India (Indian Institute of Science, Bangalore) in 1991 and again the best research paper award of 1992 by SAEST at Central Electrochemical Research Institute, Karaikudi (India). He is life member of SAEST, Electrochemical Society of India and member of Royal Society of Chemistry. He visited many countries like Germany, Hungary, Italy, Kenya, Australia, Singapore, Korea and Japan in connection with various academic assignments. He worked as visiting scientist in Central Research Institute of Chemistry, Budapest (Hungary) and at Mechanical Engineering Laboratory, Tsukuba (Japan). In addition he held many administrative positions including that of the Proctorship of the University of Delhi, post of OSD to carry out the duties of the Principal of Deshbandhu College, University of Delhi for about three years, Chief Election Officer and member of higher bodies like Executive Council etc. His work on surface characterization using X-ray photoelectron spectroscopy to supplement the corrosion study results was one of the first in the field, which gave him the top best paper awards. He has been the governing Council member of the society for the Advancement of Electrochemical Science and Technology, CECRI, Karaikudi and he is on the editorial board of (i) Trans. of the SAEST and (ii) Journal of Surface Science and Technology. He has been invited to many national and international conferences and has lectured extensively in many Universities here and

abroad. He is also currently a member of many key committees in many organizations. He has been recently honoured with **Meritorious Contribution award for the Year 2007–08** by National Association of Corrosion Engineers (NACE) USA which is the highest in this field. Recently he was invited to be a Chair Professor at Lunghwa University of Science & Technology in Taiwan and was also the Special Election observer for state assembly elections for West Bengal appointed by The Election Commission of India.

ACHIEVEMENTS OF PROF. GURMEET SINGH

Awards/ Honors Received:

- (i) **Meritorious Contribution award** (2007–08) received at Defence Institute of Advanced Technology, Pune on 7th Nov, 2008., during 14th National Association of Corrosion Engineers (NACE), USA (International Gateway India Section; NIGIS)
- (ii) The **Annapurna Award** given by the Society for Advancement of Electrochemical Science & Technology (SAEST) for the best paper of 1991 entitled, “Inhibition of zinc corrosion by benzotriazole and benzimidazole in KOH solution – surface characterization by ESCA & SEM”, Trans. SAEST 26, No. 2-3, 1991, 182-88 (given in April 1994).
- (iii) **Best paper award given by The Electrochemical Society of India**, Indian Institute of Science, Bangalore in July 1993 for the research paper entitled “Corrosion Inhibition of mild steel by some amide derivatives in sulphuric acid medium”, Vol. 40, No. 2, April-June 1991, 79-84, J. Electrochem. Society of

Administrative Activities

- (i) Member, Executive Council, University of Delhi. July 2005- Dec.2010.
- (ii) Member, Recruitment and Assessment Board (RAB), CSIR, Ministry of Science and Technology, New Delhi.
- (iii) Member, UGC Subject-Expert Committee, New Delhi.
- (iv) Member, Research Committees of GND University, Amritsar; Dr. Hari Singh Gour University, Sagar; Panjabi University, Patiala and M.D. University, Rohtak.
- (v) Member, Governing Council, SAEST, CECRI, Karaikudi (Tamil Nadu)
- (vi) Teacher in-charge of University Science Society (1976-85).
- (vii) NCC Commissioned Officer in the Naval Wing of Delhi University in the rank of Lieutenant Commander.
- (viii) Member of NCERT (CIET) group involved in making TV lessons and tape slides lessons in different topics of Chemistry.
- (ix) Deputy Proctor, University of Delhi (1994-96).
- (x) Provost, Mansarowar Hostel, University of Delhi.

- (xi) Officer-on-Special Duty (Principal), Deshbandhu College, University of Delhi (April 1997-December 1999).
- (xii) Member of International Editorial Board of Transactions of the SAEST (An Electrochemistry Research Journal).
- (xiii) Member, Rotary Club of Delhi UPTOWN. President of the Club (1999-2000) & Secretary (1998-99). Received the Outstanding President & Outstanding Secretary award in the District as well as Rotary International Presidential citation for the best club.
- (xiv) **Chief Election Officer** for conducting Delhi University Students' Union (DUSU) Elections, (2005- 2010)
- (xv) Joint Proctor, University of Delhi (2001-2005)
- (xvi) **Proctor, University of Delhi (2005-2010)**

Special Assignment

- a. ***Appointed Special Observer for the West Bengal General Assembly Elections – 2011 by The Election Commission of India.***
- b. ***Invited as Chair Professor by Lunghwa University, Taipei, Taiwan from Aug. 1st 2011 to Jan 31st 2012 to start some collaborative research.***
- c. ***Appointed 'Selected Trustee' of St. Stephen's College's Alumni Foundation Trust.***

Research Experience

- (i) As a faculty member of the Chemistry Department, Delhi University, doing research in the field of corrosion inhibition of metals, river water corrosion, corrosion properties of some amorphous alloys, surface characterization, nano layer deposition and characterization, synthesis, characterisation and application of quantum dots.
- (ii) As a teaching staff of S.G.T.B. Khalsa College (Delhi University) did independent research on metal corrosion and inhibition during the period 1981-85.
- (iii) From 1979 to 1981, I worked as one of the coworkers of Prof. A N. Maitra FNA in the Department of Chemistry, Delhi University.
- (iv) From February 1976 to November 1976, I worked as a JRF (CSIR) and then as a guest worker while teaching in a college for my doctoral thesis in the Department of Chemistry, Delhi University under the supervision of Prof. A.N. Maitra FNA.
- (v) Fourteen M. Phil. Students Supervised.
- (vi) Forty three Ph.D.Students Supervised and eight are working.
- (vii) More than hundred paper published in different journal of national and international repute.

Teaching Experience

- (i) Worked as a lecturer in Chemistry, University of Delhi from 17th November 1976 to 16th February 1987.
- (ii) Worked as a Reader (Associate Professor) from 17th February 1987 to 16th February 1997 in the Department of Chemistry, University of Delhi, Delhi-110007
- (iii) Worked as Associate Professor in the Department of Chemistry, Egerton University, P.O. Box 536, Njoro, Kenya from 1st August 1989 to 12th July 1991.
- (iv) Working as Professor since 16th February 1997 in the Department of Chemistry, University of Delhi, Delhi-110007.

Instruments Handled

Advanced Electrochemical Workstations, Photoelectrochemical Workstation, Pulsed/Direct Power Sources, Polarograph, Impedance Analyser, Rotating Ring Disc Electrode and Cyclic Voltameters, Scanning Electron Microscopes (SEM, FESEM), HRTEM, AFM, XPS etc.

International Assignments/MOUs

- (i) Visited Italy from 24th June 2009 to 12th July 2009 as a visiting Professor to deliver lectures in many Italian Universities on their invitations and to attend the 5th Indo-Italian workshop on Chemistry and Biology of Antioxidants from 6th to 8th July 2009.
- (ii) Visited South Korea from 8 October, 2007 to 19th July, 2008 as a visiting Professor on a research assignment in Kyungpook National University, Taegu.
- (iii) Visited Taiwan from 29th September, 2006 to 9th October, 2006, and delivered lectures at Yuan Ze University, Taipei
- (iv) Visited Yonsei University, Seoul, South Korea, from 15th September, 2006 to 28th September, 2006 and delivered invited lectures at Sungyukwan University, Seoul and Postech University, Pohang.
- (v) Visited Germany from 31 March, 2005 to 29, April, 2005 under INSA-DFG International Scientific Exchange Programme
- (vi) Visited Singapore in December 1996 to give a lecture on Industrially important corrosion inhibitors in the Materials Science Department of The National University of Singapore
- (vii) Visited Australia in November-December 1996 for presenting two research papers in the 13th International Corrosion Congress held at Melbourne from 24-29th November 1996
- (viii) Visited Japan in December 1995 as guest researcher of Agency for Industrial Science & Technology (AIST) under Ministry of Internal Trade & Industry (MITI) of Japanese Government

- (ix) Visited Hungary under Indo-Hungarian Scientific Exchange Programme during 12th March 1992 to 8th September 1992.
- (x) Visited Kenya to be on the Faculty of Egerton University, Njoro from 1st August 1989 to 12th July 1991.
- (xi) Visited Florence (Italy) to present a research paper in the 11th International Corrosion Congress held from 2-6th April 1990 (vide list of publications).
- (xii) Visited Institute of Physical Chemistry, Basal University, Basal, Switzerland
- (xiii) Visited Mainz (West Germany) in 1981 to present a research paper at the 8th International Congress on Metallic Corrosion (vide list of publications).
- (xiv) Visited Italy to deliver an invited talk on “Triphenyl Phosphonium derivatives-Potential antioxidants for Corrosion Inhibition” in the 8th Indo-Italian Workshop on “Chemistry and Biology of Antioxidants” held at **School of Pharmacy ,Department of Physiology and Pharmacology “Vittorio Erspamer”** P.le Aldo Moro, 5 – 00185 Rome, Italy, during 30th Nov. 2010 – 1st Dec. 2010.
- (xv) Visited Taiwan at the Invitation of their Ministry of Education from April, 7th 2011 to April 14th for working out areas of bilateral co-operation in Science and Technology.

Research activities in progress

Leading a research group at Electrochemical Laboratory in Department of Chemistry, University of Delhi with about 8 Doctoral Students, 2 Post Docs and 2 Associate Professors

Corrosion Science and Technology

- (i) **Inhibition and inhibitor structures – co-relational studies**
- (ii) **Inhibition of copper corrosion**
- (iii) **Surface characterization by ESCA and SEM**
- (iv) **Nano layer deposition and its characterization**

Smart Electrochemical Materials in Energy and Sensing Devices

- (v) **Chemical and Electrochemical growth of thin films**
- (vi) **Semiconducting Nano Materials for environmental protection**
- (vii) **Electrochemical Energy: Conversion and Storage**
- (viii) **Advanced Carbon and Conducting polymer based Nano-composites**

Important Lectures

- (i) Popular talk on Corrosion delivered at the Summer School for senior school teacher, Directorate of Education, Delhi, 1978.

- (ii) Delivered Plenary lecture in a seminar organized by University of Roorkee to in service engineers on “Corrosion inhibitors and their Industrial applications” on 11th December 1985.
- (iii) “Corrosion and its inhibition in all refineries”, at University of Roorkee, on 11th December 1986.
- (iv) “Inhibitors” at University of Roorkee on 12th January 1988.
- (v) “Corrosion in neutral medium”, in Institute of Physical Chemistry, Attila Jozsef University, H6701, P.O. Box 105, Szeged, Hungary on 4th June 1992.
- (vi) “Some new corrosion inhibitors”, in Hungarian Chemical Society, Fo Utca, Budapest on 10th June 1992.
- (vii) “Corrosion Mechanism of some guanidine derivatives”, in Department of Chemistry, University of Veszprem, P.O. Box 158, Veszprem, Hungary on 19th June 1992.
- (viii) “Some new Corrosion inhibitors”, in Institute of Chemistry and Institute of Physics”, Isotopes Laboratory, 4010 Debrecen, Hungary on 26th June 1992.
- (ix) “Corrosion inhibition by some amide derivatives”, Institute of Physical Chemistry, University of Miskolc, H-3515, Miskolc, on 1st July 1992.
- (x) “Corrosion inhibition with phosphanates derivatives”, Institute of Physical Chemistry, Eotvos Loronz University, Budapest 112, Hungary on 2nd September 1992.
- (xi) “Corrosion of Metals” Mechanical Engineering Laboratory, AIST, MITI, Tsukuba, Japan on 6th December 1995.
- (xii) “Corrosion Inhibitors of Metals” Department of Industrial Chemistry, Science University of Tokyo, Noda, Chiba. 278, Japan on 8th December 1995.
- (xiii) “Corrosion Inhibitors for Technologically important elements and alloys” Department of Molecular Science and Applied Chemistry, Faculty of Engineering, Iwate University, 4-3-5, Ueda, Morioka 020 Japan on 18, Dec. 1995.
- (xiv) “Industrially important low toxic Corrosion inhibitors” Department of Materials Science, National University of Singapore 119260 on 5th Dec. 1996.
- (xv) “Organic Inhibitors having delocalised structures” Department of Physics, Munich University, on 11, April, 2005.
- (xvi) “Some New Corrosion Inhibitors” Department of Chemistry, University of Bologna, Italy on April 13, 2005.
- (xvii) “Corrosion Inhibitors with delocalised π -electrons” in Institute for Physical Chemistry and Electrochemistry, Dresden University, Germany on April 19, 2005.
- (xviii) “Amine Induced surface modification of TOPO-Capped CdSe Nanocrystals” in Department of Advanced Materials Engineering, Sungkyunkwon University, Suwon, South Korea on 19th Sept. 2006.

- (xix) “Corrosion Inhibitors with low toxicity” in School of Civil and Environmental Engineering, Yonsei University, 134 Sinchon-dong, Seodaemoon-gu, Seoul, 120-749, South Korea on 19th Sept. 2006.
- (xx) “Corrosion inhibitors for parallel plate condensers” in Chemical Engineering Department, Yonsei University, 134 Sinchon-dong, Seodaemoon-gu, Seoul, 120-749, South Korea on 20th Sept. 2006.
- (xxi) “Synthesis, Properties and Surface Modifications of Organically Capped CdSe Quantum Dots” Center for Integrated Molecular Systems, Pohang University of Science & Technology, Pohang 790-784, Gyeongbuk, South Korea.
- (xxii) “Low energy ion induced effects on TOPO capped CdSe nanocrystals probed by XPS depth profiling and optical measurement” in Yuan Ze University, Taoyuan, Taipei, Taiwan on 29th Sept. 2006.
- (xxiii) “Effect of Oxidation induced surface state formation on the properties of Colloidal CdSe quantum dots” in National Nanotechnology Center (Nanotec), Thailand Science Park, 111, Paholyothin Road, Klong Luang, Pathuonthani 12120, Thailand on 4th October 2006.
- (xxiv) “Synthesis, Properties and Surface Modifications of Organically Capped CdSe Quantum Dots” in Department of Chemistry, Kyungpook National University, 1370 Sangyuk-dong, Duk-gu, Daegu, South Korea on 10th December 2007.
- (xxv) “Corrosion Inhibitors” in Department of Chemical Engineering, Kyungpook National University, 1370 Sangyuk-dong, Duk-gu, Daegu, South Korea on 18th July 2008.
- (xxvi) “Photocatalytic activity of TiO₂” in Department of Physical Chemistry and Electrochemistry, University of Milan, Settore Didattico via Golgi, Milan, Italy on 26th June 2009.
- (xxvii) “Process parameters for making highly photocatalytically active TiO₂ “ in Department of Chemistry, University of Venice, Santa Maria, Dorsoduro, 2137, Venezia 30123, Italy on 29th June 2009.
- (xxviii) “Environment Friendly Inhibitors – a safe Remedy for Combating Corrosion” in Department of Chemistry, University of Ferrara, Ferrara, Italy on 2nd July 2009.
- (xxix) “Importance of Corrosion Inhibitors” in CNR laboratory, Bologna, Italy on 3rd July 2009.
- (xxx) “Antioxidants in Corrosion” in Department of Chemistry, Sapienza University of Rome, Rome, Italy on 6th July 2009 during the 5th Indo-Italian workshop on Chemistry and Biology of Antioxidants.
- (xxxi) “Optimizing process parameters for making highly photocatalytically active TiO₂ film suitable for removing all organic impurities from air and water” in Department of Chemical Engineering and Material Science, University of Calabria, via P. Bucci, Cubo 45a, I-87030 Rende (CS), Italy on 9th July 2009.

- (xxxii) “Some interesting and efficient organic inhibitors for mild steel in acid medium” in Department of Chemistry, Venice University, Santa Maria, Dorsodura, 2137, Venezia, 30123, Italy on 3rd Dec. 2010.
- (xxxiii) “Photocatalytic activity of Ti compounds” in Department of Chemistry, Palermo University, Palermo, Italy on 9th Dec. 2010.
- (xxxiv) “Smart energy storage material” in Department of Chemistry, Bicocca University, Milan, Via Cozzi 53, 20125, Milan, Italy. (Università degli Studi di Milano-Bicocca Dipartimento di Scienza dei Materiali) Via Cozzi 53, 20125 Milano, Italy on 13th Dec. 2010.
- (xxxv) “Friendly Inhibitors- a Safe Remedy for Combating Corrosion” in Department of Chemistry, Milan University, Aula G07, Settore Didattico via Golgi, 19, 20133 Milan, Italy on 14th Dec. 2010.
- (xxxvi) Delivered three more invited lecture on 26th Sept. 2011, 6th Jan. 2012 and 13th Jan. 2012 in Lunghwa, Tamkung and Yuan Ze Universities respectively in Taiwan.

Books /Articles Published:

1. Adsorption kinetics and inhibition by some guanide derivatives during corrosion of Pure iron in neutral aqueous solution, **Gurmeet Singh** et. al., Advances in Corrosion Control, CECRI. 3.1(1982).
2. End of Life of Vehicles Directive, Kalpana Bhrara and **Gurmeet Singh**. Indian Surface Finishing, IV (2), P.127-132, April-June 2007.
3. Restriction on the use of Hazardous Substances Directive- International and National Scenario, Kalpana Bhrara and **Gurmeet Singh**. Indian Surface Finishing, IV(2), P.121-127, April-June 2007.
4. Corrosion Inhibitors, **Gurmeet Singh**, International Journal of Corrosion Science Reviews, Freund Publishing Co., Tel Aviv & London. (2008).

Projects Completed:

1. UGC funded project entitled “**Inhibitor Formulations for Technologically important Alloys and Elements**”.
2. CSIR funded project entitled “**Mechanism and Control of Microbial Corrosion in Petroleum industry with special reference to Pipelines**”.
3. UGC funded project entitled “**Conducting Polymers as Corrosion Inhibitors**”. Sanctioned vide letter no.F.12-13/2003 dated 31st March 2003. **Amount of project: Rs 4, 28,060/=**
4. DST funded project entitled “**Investigation of the Dissolution Kinetics of**

the Nano-sized metal catalysts”.

5. DST funded project entitled “Chemical and Electrochemical Growth and characterization of some novel Semiconductor nano-films for Efficient photovoltaic applications”. Sanctioned vide letter no. SR/S1/PC –04/2002 dated 13th June 2003. Amount of Project : Rs. 13,11,600/-.

On Going/Under Implementation

1. *Synthesis and Application of Highly Dispersed, Functionalized Multiwall Carbon nanotube Supported Conducting Polymer/Metal oxide nano-composite material as electrodes in a supercapacitor device* **Council of Scientific and Industrial Research, New Delhi Rs 28 lacs**
2. *Synthesis and Characterization of Conducting Polymer based Nano-composite Hybrid Electrodes; Development of the Supercapacitor Device through Modeling the Novel Structures* **Department of Science and Technology, New Delhi, Rs 55 lacs**
3. *Synthesis and Charcaterization of MWCNT Supported TiO₂/CdS Nanocomposite electrodic membranes for removal of Contaminants in drinking water* **International Science Foundation (IFS), France**
4. *Metal oxide embedded ordered conducting polymer nano-composite electrodes for application in Supercapacitor Device* **University Grant Commission, Delhi. Rs 27 lacs**
5. *Green Corrosion Inhibitors and Phosphonium compounds as inhibitors for (i) Water Treatment Systems and (ii) Coating Applications,* **In-house Project, Delhi University**
6. *UGC funded project entitled, “Phosphonium Compounds as Corrosion inhibitors,”* Sanctioned vide letter no. 33-265/2007(SR) dated 28th
7. *Investigations of Magnetic, Optical and Electrical Properties of Nanomaterials: Synthesis, Characterisation and Application,* Department of Science and Technology (DST) New Delhi. **Rs 5.7 Crores**
8. **Triphenyl phosphonium derivatives as potential corrosion inhibitors for mild steel and other alloys”** DST project sanctioned vide letter no. SR/Si/PC-15/2011 dated 26th April 2012. **Rs. 48.00 lacs.**
9. **Schiff bases as Corrosion Inhibitors for mild steel in acidic media.** University Grants Commission, sanctioned vide letter no. F.No. 42-319/2013 (SR) dated 12 March 2013. **Rs.12,16,800/-.**