

# DR. SYED NADIR HUSSAIN

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## Education

- **PhD** in Chemical Engineering from School of Chemical Engineering and Analytical Sciences, The University of Manchester, Manchester, UK (2008-2012). Thesis Title: *Water Treatment using graphite adsorbents with electrochemical regeneration supervised by Dr. E.P.L Roberts*
- **M.Sc (Engg.)** in Chemical Engineering from Institute of Chemical Engineering and Technology, University of the Punjab, Lahore, Pakistan (2003-2004). Thesis Title: *Study of Mass Transfer Characteristics of Turbulent Bed Contactor supervised by Prof. Dr. Arshad Chughtai*
- **B.Sc (Engg.)** in Chemical Engineering from Institute of Chemical Engineering and Technology, University of the Punjab, Lahore, Pakistan (1991-1996). Thesis Title: *Plant design report on the production of Polyester Chips from terephthalic acid and ethylene glycol supervised by Prof. Dr. Khalid Naushahi*
- **F.Sc** (Pre-Engineering) from Government College Lahore, Pakistan (1988-1990)
- **Matriculation** from Lahore Public School, Lahore Pakistan (1988)

## Awards and Honors

- Throughout First Division in educational career
- First Position in M.Sc (Engg.) Chemical Engineering
- Two Gold Medals in M.Sc (Engg.) Chemical Engineering
- Second Position in B.Sc (Engg.) Chemical Engineering
- Invited Reviewer of the Journal of Hazardous Materials; Elsevier Publishing
- Invited Reviewer of Journal of Industrial and Engineering Chemistry Research; ACS Publications
- Invited Reviewer of the Journal of Chemical Engineering Communications; Taylor and Francis Publishing
- Selected as Technical Manager in Arvia Technology Ltd, UK after the completion of PhD studies

## **Scholarships**

- Post graduate research scholarship (2007) awarded by University of Petronas, Department of Chemical Engineering, Malaysia (declined)
- PhD Scholarship under Faculty Development Program (University of the Punjab)
- Sazkar Talent Scholarship (University of the Punjab)
- Merit Scholarship (University of the Punjab)
- Merit Scholarship (Government College Lahore)

## **Industrial Experience:**

**Rupali Polyester Limited.**  
**Sheikhupura**

**(From 1997 to 2002)**

As Chemical Engineer & Assistant Manager, I was involved in the following activities:

- To keep the production of final product within specifications keeping in view the quality control reports by maintaining all process conditions like temperature, pressure, flow rate etc.
- To coordinate with electrical, mechanical and instrument department for the execution of the schedule jobs of the shift regarding the maintenance and smooth functioning of the equipment.
- To instruct working staff to secure safe plant operation, minimum down times in emergencies and shutdowns of machines / equipment.
- To handle troubleshooting and emergency during power failure or failure of any utility of the plant.
- To manage working force which consist of supervisors, skilled and unskilled operators regarding safety awareness, job allocation and training in order to have effective control on the operation and the smooth running of the plant.
- To make adjustment of manpower in case of leave of any staff member.
- To suggest / supervise modification work at the plant under the guidance of seniors.
- To handle scheduled shutdown and startups of whole plant.
- To monitor and co-ordinate all the activities regarding scheduled shutdown, maintenance and startup of dowtherm oil heaters.

**Wazir Ali Industries Ltd.**  
**Hyderabad**

**(From JUN 1997 to NOV 1997)**

As Trainee Assistant Manager (Production), I was involved in the following activities:

- To undergo an intensive hands on training of production and laboratory departments.
- To learn all operational aspects, understand different mechanisms, process and line tracing.
- To gain experience by performing all laboratory tests. (Analysis of raw, intermediate and finished products and packaging materials).
- To submit comprehensive reports at end of each section.

**Ittehad Chemicals Ltd.**  
**Kalashah Kaku**

**(1.5 months in 1994)**

*As an internee I got extensive training in production in different plants of Ittehad Chemicals Ltd including:*

- Sodium Hydroxide Plant
- Hydrochloric acid and Sulphuric acid Plants
- Hypochlorite Plant

**Research and Teaching Experience:**

**Institute of Chemical Engineering & Technology, University of the Punjab (from 2002 to 2008)**

- I was involved in teaching various subjects of Chemical Engineering including Fluid & Particle Mechanics, Heat & Mass transfer operations and Instrumentation & Process control to B.Sc (Engg) students
- Supervised Process Design and Chemical Plant Design Projects of undergraduate students
- Involved in the design, fabrication and operation of new laboratory scale experimental rigs (Three phase fluidized bed reactor, Toricelli apparatus, Cyclone separator etc.)

**School of Chemical Engineering & Analytical Sciences, University of Manchester, UK (from 2008 to 2012)**

**Teaching assignments:**

During my PhD studies, I was involved in part time teaching.

- Giving practical demonstrations on Heat Transfer Operations at the School to undergraduate students during 2009-2011.
- Providing guidance to M.Sc Chemical Engineering students in their projects related to wastewater treatment during 2009-2012

**Doctoral Candidate:**

Involved in extensive research work on the project entitled 'Wastewater treatment using graphite adsorbents with electrochemical regeneration' at School of Chemical Engineering and Analytical Science, University of the Manchester, United Kingdom

**Institute of Chemical Engineering & Technology, University of the Punjab (from 2012 till date)**

- I am involved in teaching the subjects of Mass transfer and Separation processes to B.Sc Engg students, and the subject of Biochemical Engineering to M.Sc Chemical Engineering class
- I am also teaching Instrumental techniques in Chemical Engineering to PhD students
- Supervision of B.Sc and M.Sc Chemical Engineering students in their research projects
- At presently, One PhD student is enrolled under my supervision. He is working on the development of polymeric membranes for wastewater treatment applications.

**Administrative Assignments at Institute of Chemical Engineering & Technology (ICET)**

- Student Advisor (July 2007 – Mar 2008)
- In-charge Time Table (Jan 2007 – Mar 2008)
- Incharge Annual Report (April 2007 – Mar 2008)
- Incharge Industrial Training (Jan 2013– to date)
- Incharge Industrial Tour (Jan 2013– to date)
- Team Leader of Quality Assurance Activities (Aug 2012 – to date)
- Incharge Maintenance and Operation (Jun 2012 – to date)

## **Memberships**

- Member of Pakistan Engineering Council (PEC)
- Member of Board of Studies of Institute of Textile Engineering, University of the Punjab.
- Member of Doctoral Programme Committee at the Institute of Chemical Engg. & Tech.
- Member of Admission Committee at the Institute of Chemical Engg. & Tech.
- Member of Curriculum Development at the Institute of Chemical Engg. & Tech.

## **Research Interests**

Water and wastewater treatment

Wastewater treatment by adsorption and electrochemical regeneration

Membrane separation processes

Three Phase Fluidization

## **Research Collaboration**

Collaboration with Arvia Technology Ltd; UK to carry out research on wastewater treatment

## **External Linkages Development**

Developed research link with the University of Brighton, UK to conduct joint work on the disinfection of water.

## **Research Grants**

- Research grant of Rs. 1,50,000/- form University of the Punjab to carry out research on breakdown products generated during electrochemical regeneration of adsorbents for wastewater treatment during the year 2012
- Research grant of Rs. 1,50,000/- form University of the Punjab to carry out research on treatment of textile wastewater during the year 2013.
- A research project on wastewater treatment by adsorption with electrochemical regeneration, Submitted to Pakistan Science Foundation worth Rs.200,000/- (co-investigator)

## **Research Supervision**

- Presently, two PhD students are working under my supervision on the development of polymeric membranes for wastewater treatment applications
- Supervised eight M.Sc Chemical Engineering research projects
- Supervised almost twenty five B.Sc Chemical Engineering Plant design projects.

## **Patents, Conferences & Publications:**

### **Patents**

1. E.P.L. Roberts, N.W. Brown, **S.N. Hussain**. Adsorption of contaminants from liquid and electrochemical regeneration of adsorbent. Patent application no. 20120228230, dated 13<sup>th</sup> September 2012.

### **International Conference Proceedings and Oral Presentations**

1. **S.N. Hussain**, H.M.A. Asghar, H. Sattar and E.P.L. Roberts. Electrochemical regeneration of GIC adsorbent in a continuous electrochemical reactor. *International Conference on Chemical Engineering and Process Technology to be held in Istanbul, Turkey on 22-23 Dec 2014*. Paper accepted for oral presentation as well as inclusion in conference proceedings.
2. H.M.A. Asghar, T. Ahmad, S.N. Hussain and H. Sattar. Electrochemical oxidation of methylene blue in aqueous solution. *International Conference on Chemical Engineering and Process Technology to be held in Istanbul, Turkey on 22-23 Dec 2014*. Paper accepted for oral presentation as well as inclusion in conference proceedings.
3. **S.N. Hussain**, H.M.A. Asghar, E.P.L. Roberts, N.W. Brown, H. Sattar. Formation of by-products during regeneration of various graphitic adsorbents in a batch electrochemical reactor. *International Conference on Environmental Management, Technology and Engineering*, September 12-13, 2013, Singapore. It is organized by World Academy of Science, Engineering and Technology
4. H.M.A. Asghar, **S.N. Hussain**, H.Sattar, N.W. Brown, E.P.L. Roberts. GIC based adsorbents for wastewater treatment through adsorption and electrochemical regeneration. *International Conference on Environmental Management, Technology and Engineering*, September 12-13, 2013, Singapore. It is organized by World Academy of Science, Engineering and Technology (WASET).

5. M.C.Ramsden, **S.N. Hussain**, N. Heras, E.P.L. Roberts, N.W. Brown. Wastewater treatment by adsorption on flake graphite with electrochemical regeneration. *Proceedings of the International Conference on Environmental Pollution and Remediation*, July 15-17 2013, Toronto, Ontario, Canada.
6. **S.N. Hussain**, N. Heras, H.M.A. Asghar, N.W Brown, E.P.L. Roberts. Disinfection of water by adsorption combined with electrochemical treatment. Environmental Division (156c), *AIChE Annual Meeting (2013)*, November 4, San Francisco CA
7. **S.N. Hussain**, H.M.A. Asghar, E.P.L Roberts, N.W. Brown. Disinfection of water by adsorption with electrochemical regeneration. *International Conference on Environmental Sciences and Engineering*, December 24-25, 2012, Phuket, Thailand. It was organized by World Academy of Science, Engineering and Technology (WASET).
8. H.M.A. Asghar, **S.N. Hussain**, E.P.L Roberts, N.W. Brown. Development of composite adsorbents for wastewater treatment using adsorption and electrochemical regeneration. *International Conference on Environmental Sciences and Engineering*, December 24-25, 2012, Phuket, Thailand. It was organized by World Academy of Science, Engineering and Technology (WASET).
9. NW Brown, EPL Roberts, **S.N Hussain**, N De-Heras, P Gaffey, A Gaffey and M Keighley Development of a grey water treatment system, *Envirolink NW & IEMA Knowledge Exchange 2011*, Manchester, UK
10. E.P.L. Roberts, **S.N. Hussain**, H.M.A. Asghar, F.M. Mohammad, M.C. Ramsden, N.W. Brown, A.K. Campen. Water treatment by adsorption and electrochemical regeneration. *10th AIChE Annual Meeting* held on November 7-12, 2010, Salt Lake City, USA
11. **S.N Hussain** and E.P.L Roberts (2010). Electrochemical disinfection of water by the Arvia<sup>®</sup> process. *International Postgraduate Conference*, The University of Manchester, UK. 9-10, June, 2010.
12. H.M.A. Asghar, **S.N. Hussain**, E.P.L. Roberts, A.K. Campen & N.W. Brown (2010) "Improved Dye Adsorption for Water Treatment using the Arvia Process" *1<sup>st</sup> International Water Quality Conference*, Leeds, UK. 23 to 24 June, 2010.
13. **S.N. Hussain**, E.P.L. Roberts, H.M.A. Asghar, A.K. Campen & N.W. Brown (2010). Fate of Adsorbed Species during Electrochemical Regeneration of a Graphite Adsorbent. *International Conference on Electrochemistry and Sustainability*, University of Wolverhampton, Telford Campus, UK. 14 to 15 September, 2010.
14. **S.N Hussain**, E.P.L Roberts, A.K Campen and N.W Brown (2009). Electrochemical regeneration of carbon based adsorbents (Part I). *International Postgraduate Conference*, The University of Manchester, 16<sup>th</sup> June, 2009
15. **S.N Hussain**, E.P.L Roberts, A.K Campen and N.W Brown. Electrochemical regeneration of carbon based adsorbents (Part II), *Electrochem 2009*: 16-17<sup>th</sup> September 2009 at the University of Manchester, UK

## **Journal Articles**

1. **S.N. Hussain**, H.M.A. Asghar, H. Sattar, E.P.L. Roberts, (2014). Electrochemical regeneration of various graphitic adsorbents in an air agitated sequential batch reactor. *Chemical Engineering and Science*, 2(2), 24-29
2. **S.N. Hussain**, H.M.A. Asghar, H. Sattar, N.W Brown & E.P.L, (2014) Roberts. Chlorinated breakdown products formed during oxidation of adsorbed phenol by electrochemical regeneration of a graphite intercalation compound. *Electrochimica Acta*, article under review. **IF=3.777**
3. **S.N. Hussain**, H.M.A. Asghar, H. Sattar, E.P.L. Roberts, (2014). Removal of Tartrazine-a hazardous dye from water by adsorption using a graphite intercalation compound with electrochemical regeneration. *Chemical Engineering Communications*, Accepted. **IF=1.052**
4. H.M.A. Asghar, **S.N. Hussain**, H.Saattar, N.W. Brown & E.P.L. Roberts, (2014). Mercaptan's removal from aqueous solution using modified graphite based adsorbent through batch-wise adsorption-regeneration. *Chemical Engineering Communications*, accepted.
5. H.M.A. Asghar, **S.N. Hussain**, N.W. Brown, E.P.L. Roberts. Synthesis of electrically conducting adsorbents for wastewater treatment using adsorption and electrochemical regeneration. *Journal of industrial & Engineering Chemistry*. 20(2014) p. 781-786. **IF= 2.145**
6. H.M.A. Asghar, **S.N.Hussain**, H. Sattar, N.W. Brown, E.P.L. Roberts, (2014). Electrochemically synthesized GIC-based adsorbents for water treatment using adsorption and electrochemical regeneration. *Journal of Industrial & Engineering Chemistry*, 20, 2200-2207. **IF= 2.145**
7. H.M.A. Asghar, **S.N. Hussain**, H. Sattar, N.W. Brown, E.P.L. Roberts, (2014). Environmentally friendly preparation of exfoliated graphite. *Journal of industrial & Engineering Chemistry*, 20, 1936-1941. **IF= 2.145**
8. H.M.A. Asghar, **S.N. Hussain**, A.K. Campen, N.W. Brown, E.P.L. Roberts, (2014). Improved Phenol Adsorption from Aqueous Solution using Electrically Conducting Adsorbents. *Korean Journal of Chemical Engineering*, 31(5), 834-840. **IF=1.059**
9. **S.N. Hussain**, N. Heras, N.W. Brown, E.P.L. Roberts, (2014). Disinfection of water by adsorption combined with electrochemical treatment. *Water Research*, 54, 170-178. **IF= 4.655**
10. H.M.A. Asghar, **S.N.Hussain**, H. Sattar, N.W. Brown, E.P.L. Roberts, (2014) Potential graphite materials for the synthesis of GICs. *Chemical Engineering Communications*, accepted for publication. DOI: 10.1080/00986445.2013.850580. **IF=1.052**



11. **S.N. Hussain**, E.P.L. Roberts, H.M.A. Asghar, A.K. Campen and N.W. Brown, (2013). Oxidation of phenol and the adsorption of breakdown products using a graphite adsorbent with electrochemical regeneration, *Electrochimica Acta*, 92, 20-30. **IF=3.777**
12. H.M.A. Asghar, **S.N. Hussain**, A.K. Campen, N.W. Brown, E.P.L. Roberts, (2013). Pretreatment of adsorbents for wastewater treatment using adsorption coupled with electrochemical. *Journal of industrial & Engineering Chemistry*, 19, 1689-1696. **IF=2.145**
13. **S.N. Hussain**, H.M.A. Asghar, A.K. Campen, E.P.L. Roberts, (2013). Breakdown products formed due to oxidation of adsorbed phenol by electrochemical regeneration of a graphite adsorbent. *Electrochimica Acta*, 110, 550-559. **IF=3.777**
14. H.M.A. Asghar, **S.N. Hussain**, E.P.L. Roberts, N.W. Brown, (2014). Removal of humic acid from water by adsorption coupled with electrochemical regeneration. *Korean Journal of Chemical Engineering*. 31(5), 834-840. **IF=1.059**
15. H.M.A. Asghar, E.P.L. Roberts, **S.N. Hussain**, A.K. Campen & N.W. Brown, (2012). Wastewater treatment by adsorption with electrochemical regeneration using graphite-based adsorbents. *Journal of Applied Electrochemistry*, 42, 797-807
16. M.G. Conti-Ramsden, H.M.A. Asghar, **S.N. Hussain**, E.P.L. Roberts & N.W. Brown, (2012). Removal of mercaptans from a gas stream using continuous adsorption-regeneration. *Water Science and Technology*, 66(9), 1849-1855. **IF=1.102**
17. Arshid M.Ali, Ayaz Muhammad, Amir Shafiq, Hafiz M.A.Asghar, **Syed N.Hussain** and Hamid Sattar, (2012). Doped Metal Oxide (ZnO) and Photocatalysis: A review. *Journal of Pakistan Institute of Chemical Engineers*, 40(1), 11-19.
18. M.R Usman, **S.N.Hussain**, H.M.A.Asghar, H.Sattar and A. Ijaz, (2011). Liquid-Liquid extraction of acetic acid from an aqueous solution using a laboratory scale sonicator. *Journal of Quality and Technology Management*, 2(2), 115-121.
19. M.R. Usman, H. Sattar, **S.N. Hussain**, H.M.A. Asghar & W. Afzal, (2009). Drop Size in Liquid Pulsed Sieve-plate Extraction Column. *Brazilian Journal of Chemical Engineering*, 26 (4), 677-687.
20. M.R Usman, **S.N Hussain**, L.Rehman, M.Bashir and M.A.Butt, (2006). Mass transfer performance in a pulsed-sieve plate extraction column. *Proceedings of Pakistan Academy of Sciences*, 43(3), 173-179.
21. H.M.A. Asghar, **S.N. Hussain**, H. Sattar, A. Chughtai & M.A. Butt, (2006). Hydrodynamic Study of Three Phase Inverse Fluidized Bed, *Journal of Faculty of Engineering and Technology*, 91-101.
22. H. Sattar, **S.N. Hussain**, H.M.A. Asghar, A. Chughtai & M.A. Butt (2006). Production and Characterization of Activated Carbon from Indigenous Coal (Lakhra Coal). *Journal of Faculty of Engineering and Technology*, 79-86.

### **Conferences/Symposium Chaired:**

1. Chaired a technical session on 'Environmental Engineering' in the First International Young Engineers Convention held on 18<sup>th</sup> April, 2014 at University of Engineering and Technology Lahore, Pakistan.
2. Co-chaired the technical session on Environmental Sciences in the 5<sup>th</sup> Symposium on Engineering Sciences held on 2<sup>nd</sup> April 2014 at the Institute of Chemical Engineering and Technology, University of the Punjab, Lahore, Pakistan.
3. Judged various technologies displayed in the 3<sup>rd</sup> Invention to Innovation Summit 2014 held on March 19-20 at the Undergraduate Block, University of the Punjab, Pakistan.

### **Conferences/Seminars/Workshops/Trainings Attended:**

1. 5<sup>th</sup> Symposium on Engineering Sciences held on 2<sup>nd</sup> April 2014 at the Institute of Chemical Engineering and Technology, University of the Punjab, Pakistan.
2. 3<sup>rd</sup> Invention to Innovation Summit 2014 held on March 19-20 at the Undergraduate Block, University of the Punjab, Pakistan.
3. First International Young Engineers Convention held on 18<sup>th</sup> April, 2014 at University of Engineering and Technology Lahore, Pakistan.
4. Training course on 'Advanced Instrumental and Spectroscopic Techniques applied to Electrocatalysis' held on 14-16 September, 2009 at the University of Birmingham, UK
5. Fifth European Summer School on Electrochemical Engineering held on 6-11 September, 2009 at Almagro, Spain.
6. Laser safety training at University of the Manchester held on September 06, 2009
7. Training workshop on 'Quality Assurance in Higher Education' held on March 9, 2007 at Hotel Ambassador, Lahore, Pakistan.
8. National Curriculum Revision Committee Preliminary Meeting in Chemical Engineering held on July 31- August 2, 2007 at Higher Education Commission Regional Centre, Lahore.
9. Two 34<sup>th</sup> Pakistan (SAARC) Countries Science Conference, 20-22 Feb, 2006 on "Sustainable Pest Management in Modern Agriculture" conducted by Pakistan Association for the Advancement of Science at University of Veterinary and Animal Sciences, Lahore, Pakistan.
10. Workshop on Research and Development Needs in Pulp and Paper Industry held on September, 20, 2006 at the Institute of Chemical Engineering and Technology, University of the Punjab, Pakistan.
11. Workshop on Research and Development Needs in Textile Processing held on March 28, 2006 at Institute of Chemical Engineering and Technology, University of the Punjab, Pakistan.

- 12.** Annual national seminar on Engineering materials organized by the council of Pakistan institute of metallurgy and materials held on December 04, 2004 at the Institute of Chemical Engineering & Technology, Punjab University, and Lahore.
- 13.** 1<sup>st</sup> International Chemical Engineering Congress held on April 29-30, 2003, Avari Hotel Lahore, Pakistan.
- 14.** Workshop on “Hazardous Waste Management”, organized by Atomic Energy Mineral Centre & University of the Punjab, held on 3-7 February, 2003 at post graduate center for Earth Sciences, University of the Punjab, Pakistan.
- 15.** Workshop on Information Handling Techniques held on April 21-24, 2003 at Institute of Engineering and Technology, University of the Punjab, Pakistan.
- 16.** Seminar on Creation of Wealth through Manufacturing Management held on March 14, 2005 at Institute of Quality and Technology Management, University of the Punjab, Pakistan.
- 17.** Four weeks training course on Quality Management System ISO 9001-2001 held on May 24, 2004 at the Institute of Chemical Engineering and Technology, Punjab University.
- 18.** Teacher training Orientation program held in July, 2003 at the Institute of Administrative Sciences, University of the Punjab, Pakistan.