1. SUMMARY OF EXPERIENCE RECORD

1.1 PERSONAL

Name: Muhammad S. Vohra
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1.2 EDUCATION

Ph.D. Civil Engineering, University of Maryland, USA (**1998**) Option: Environmental Engineering. *Dissertation Title*: 'Adsorption and photocatalysis of Pb(II)-Ligand complexes in TiO_2 Suspensions.' Advisor: Dr. Allen P. Davis.
M.Sc. Civil Engineering, University of Maryland, USA (**1993**) Option: Environmental Engineering. *Thesis Title*: 'Effects of different physical and chemical properties of TiO_2 on the initial photocatalytic oxidation rate of toluene.' Advisor: Dr. Allen P. Davis.
B.E. Civil Engineering, NED University, Pakistan (**1990**)

1.3 SPECIALIZATION Civil Engineering, *Option: Environmental Engineering*

1.4 EMPLOYMENT

1) *Associate Professor, Civil Engineering Department, King Fahd University of Petroleum & Minerals (KFUPM), Dhahran, Saudi Arabia. Jan 2012-Present.* At present I teach environmental engineering courses both at the undergraduate and graduate level. I have also supervised several Capstone Projects, Summer Training Sessions, and Masters Thesis at KFUPM. Additionally I also remain involved with Undergraduate Advising and *CE-Club's* Design Competition Project. I have been the Principal Investigator for several KACST, SABIC, and KFUPM funded projects. I have also served in several committees at KFUPM.
2) *Assistant Professor, Civil Engineering Department, King Fahd University of Petroleum & Minerals (KFUPM), Dhahran, Saudi Arabia. Sept-2003- Dec-2011.*
3) *Pohang University of Science and Technology, Pohang, South Korea.* **02**. *Research Fellow*. Investigated the destruction of nitrogenous organic pollutants (especially those used in the electronics industry) using the Titanium dioxide (T_iO_2) assisted photocatalytic degradation process. The substrate degradation behavior, both at the micro and macro scale, was studied.
4) *National Institute of Materials and Chemical Research, Tsukuba, Japan*. **99-01**. *Research Fellow*. The surface properties of TiO_2 catalyst were modified using different additives to achieve higher photocatalytic degradation rates for pesticides, surfactants, and hormone disrupting aqueous pollutants.
5) *University of Maryland, College Park, USA*. **93-98**. *Research Assistant*. Mixed aqueous wastes containing both toxic metals and organic ligands (such as EDTA, NTA) were successfully treated using the TiO_2 assisted photocatalytic degradation process, with near complete metal removal from the aqueous phase. An extensive study explaining the adsorption pattern of Pb/EDTA and Pb/NTA species onto TiO_2 was also completed. The adsorption behavior was also modeled using the geo-chemical speciation software MINTEQA2. Completed wastewater treatment studies for electroplating industries via the *Engineering Research Center* during 94-97. Also whenever needed, assisted the faculty with graduate and undergraduate courses on water and wastewater treatment.

2. TEACHING

2.1 COURSES TAUGHT (at KFUPM)

1) CE 201 - Statics
2) CE 330 - Environmental Engineering Principles
3) CE 370 - Water and Wastewater Engineering *(Old CE Program)*
4) CE 471 - Water and Wastewater: Treatment and Reuse
5) CE 472 - Environmental Engineering *(Old CE Program)*
6) CE 473 - Design and Operation of Water and Wastewater Treatment Plants
7) CE 541 - Chemistry in Environmental Engineering
8) CE 543 - Air Pollution Engineering
9) CE 544 - Unit Operations and Processes Laboratory
10) CE 546 - Industrial Water and Wastewater Treatment
11) CE 547 - Physical and Chemical Processes
12) CE 606 - Directed Research
13) CE 641 - Chemical Processes in Environmental Engineering
14) CE 645 - Hazardous Waste Management
15) CE 647 - Municipal Solid Waste Management

2.2 COURSE DEVELOPMENT

1) CE 330 - Environmental Engineering Principles
2) CE 471 – Water and Wastewater: Treatment and Reuse
3) CE 543 - Air Pollution Engineering
4) CE 641 - Chemical Processes in Environmental Engineering

2.3 SENIOR PROJECT, SUMMER TRAINING, AND COOP SUPERVISION

1) SENIOR PROJECTS: **17** Projects (Advisor - 9, Member - 8)

2) SUMMER TRAINING: Coordinator between **2005-2008**

3) COOP: **3** Projects (Member)

2.4 STUDENT ADVISING

1) Advisor to several civil engineering students

3. MASTER STUDENT SUPERVISION

3.1 THESIS SUPERVISED (Advisor)

No.	Thesis Title (Student)	Start Date (approx.)	End Date	Role
1	Photocatalytic Removal of Aqueous Phase Pollutants Using Modified TiO_2 (**Md. M. I. Chowdhury**)	08-2009	06-2010	Advisor
2	Treatment of Petroleum Refinery Wastewater Using TiO_2-Mediated Photocatalysis (**Sikder M. Selimuzzaman**)	11-2005	11-2006	Advisor
3	Treatment of the Oil Refinery Wastewater Using Photocatalysis (**Syed A. Malik**)	09-2004	05-2005	Advisor

3.2 THESIS SUPERVISED (Member)

No.	Thesis Title (Student)	Start Date (approx.)	End Date	Role
1	Effect of CO_3^{2-}, HCO_3^-, and SO_4^{2-}, on the Degradation of Phenol in Electrochemical Oxidation Process (**Bushra O. I. M. Ahmad**)	01-2009	01-2010	Member
2	Domestic Water Demand Forecasting Using Artificial Neural Networks and Time Series (**Amin A. Abo-Monasar**)	12-2009	05-2010	Member
3	Effect of Electrodes Material on the Degradation of *p*-Cresol in Electrochemical Process (**Mufid M. Abu-Eideh**)	05-2009	05- 2010	Member
4	Treatment of Simulated Petrochemical Wastewater by Means of Continuous Electrocoagulation/Ultrafiltration Process (**Mahmood A. R. Siddiqui**)	2005	12-2006	Member
5	Treatment of Simulated Dairy Wastewater by Electrocoagulation (**Mansoor Jehangir**)	2005	12-2006	Member
6	Treatment of Refinery Wastewater Using Cross Flow Membrane Bioreactor - CF-MBR (**Muhammad M. Rahman**)	09-2003	12-2004	Member
7	Optimal Locations of Booster Disinfection Stations in Al-Khobar Water Distribution System (**Naeem Akhtar**)	09-2003	05-2004	Member

4. RESEARCH

4.1 RESEARCH INTERESTS

Use of solar energy for wastewater purification, advanced oxidation processes (AOPs) including photocatalysis for water purification, development of modified photocatalysts for charged aqueous phase pollutants removal, production of granular activated carbon using agricultural waste material, wastewater treatment using granular activated carbon, removal of metal-complexes from polluted aqueous streams using adsorption process, adsorption modeling, environmental monitoring including air pollution monitoring, competitive degradation of some common petroleum refinery wastewater pollutants using photocatalysis, etc.

4.2 PROJECTS as P.I.

a) Completed

1) TREATMENT OF PRETREATED PETROLEUM REFINERY WASTEWATER USING TiO_2 ASSISTED ADVANCED REDOX TECHNOLOGY.

2) ENVIRONMENTAL EFFECTS OF WASTEWATER TREATMENT PLANTS: EVALUATION & GUIDELINES.

3) PRODUCTION OF GRANULAR ACTIVATED CARBON FROM DATE PALM TREE BRANCHES.

4) REMOVAL OF THIOCYANATE FROM SIMULATED INDUSTRIAL WASTEWATER USING PHOTOTALYSIS: EFFECT OF CO-POLLUTANTS.

b) In Progress

1) USE OF SOLAR RADIATION ENERGIZED 'TIO_2-PHOTOCATALYSIS AND PHOTO-FENTON' ADVANCED OXIDATION PROCESSES FOR THE REMOVAL OF SOME CRITICAL INDUSTRIAL WASTEWATER POLLUTANTS: A CASE STUDY FOR DHAHRAN, KINGDOM OF SAUDI ARABIA.

4.3 PUBLICATIONS

a) Refereed Journals

1) **Vohra**, M.S. Effect of Co-Pollutants Thiosulfate and Ammonia on to TiO_2 Mediated Photocatalytic Removal of Thiocyanate from Synthetic Wastewater, ***Fresenius Environmental Bulletin*** (Accepted).
2) **Vohra**, M.S., (**2011**). Removal of Thiocyanate from Synthetic Wastewater Using TiO_2 Mediated Photocatalytic Degradation Process, ***Fresenius Environmental Bulletin***, 20 (5A), p. 1308-1313.
3) **Vohra**, M.S., Selimuzzaman, S.M., and Al-Suwaiyan, M.S. (**2011**). Aqueous Phase Thiosulfate Removal Using Photocatalysis. ***International J. Environmental Research***, 5 (1), p. 247-254.
4) **Vohra**, M.S., (**2010**). Adsorption of Lead, Ethylenediaminetetraacetic Acid and Lead-Ethylenediaminetetraacetic Acid Complex onto Granular Activated Carbon, ***Int. J. Environ. Sci. Tech.***, 7 (4), p. 687-696.
5) **Vohra**, M.S., Selimuzzaman, S.M., and Al-Suwaiyan, M.S. (**2010**). NH_4^+-NH_3 Removal from Simulated Wastewater Using UV-TiO_2 Photocatalysis: Effect of Co-Pollutants and pH. ***Environmental Technology***, 31 (6), p. 641-654.
6) **Vohra**, M.S., Lee, J., and Choi, W. (**2005**). Enhanced Photocatalytic Degradation of Tetramethylammonium on Silica-loaded Titania, ***J. of Applied Electrochemistry***, 35, p. 757-763.
7) **Vohra**, M.S., and Tanaka, K. (**2003**). Photocatalytic Degradation of Aqueous Pollutants Using Silica-modified TiO_2, ***Water Research***, 37 (16), p. 3992-3996.
8) **Vohra**, M.S., Kim, S., and Choi, W. (**2003**). Effects of Surface Fluorination of TiO_2 on the Photocatalytic Degradation of Tetramethylammonium, ***J. Photochem. Photobiol. A: Chem.***, 160, p. 55-60.
9) **Vohra**, M.S., and Tanaka, K. (**2002**). Photocatalytic Degradation of Nitrotoluene in Aqueous TiO_2 Suspension, ***Water Research***, 36 (1), p. 59-64.
10) **Vohra**, M.S., and Tanaka, K. (**2001**). Enhanced Photocatalytic Activity of Nafion-coated TiO_2, ***Environ. Sci. & Technol.***, 35, p. 411-415.
11) **Vohra**, M.S., and Davis, A.P. (**2000**). TiO_2-assisted Photocatalysis of Pb(II)-EDTA Complex, ***Water Research***, 34, p. 952-964. **(Ph.D. Work)**
12) **Vohra**, M.S., and Davis, A.P. (**1998**). Adsorption of Pb(II), EDTA, and Pb(II)-EDTA onto TiO_2, ***J. Colloid Interface Science,*** 198, p. 18-26. **(Ph.D. Work)**
13) **Vohra**, M.S., and Davis, A.P. (**1997**). Adsorption of Pb(II), NTA, and Pb(II)-NTA onto TiO_2, ***J. Colloid Interface Science***, 194, p. 59-67. **(Ph.D. Work)**
14) Davis, A.P., and **Vohra**, M.S. (**1994**). Comment on "Biosorption of Chlorophenols to Anaerobic Granular Sludge", ***Water Research***, 28, p. 741-742.

b) Refereed Technical Conference Proceedings

1) **Vohra**, M.S., Al-Zahrani, M.A., Essa, M.H., and Rahman, M.M. (**Extended Abstract**). Synthetic Industrial Wastewater Treatment Using GAC Produced from Date Palm Tree Branches. 8th International Conference and Exhibition on Chemistry in Industry (CHEMINDIX 2010), Bahrain, October **2010**.
2) **Vohra**, M.S., Al-Suwaiyan, M.S., and Malik, S.A. (**Extended Abstract**). Treatment of Mixed Wastewater Using Photocatalysis. 7th International Conference and Exhibition on Chemistry in Industry (CHEMINDIX 2007), Bahrain, March **2007**.
3) **Vohra**, M.S., Malik, S.A., and Al-Suwaiyan, M.S. Treatment of Synthetic Pretreated Petroleum Refinery Wastewater Using TiO_2-Assisted Photocatalysis. Fourth Saudi Technical Conference & Exhibition, Riyad, December **2006**, **Paper # 718**.
4) **Vohra**, M.S., and Al-Suwaiyan, M.S. Planning, Design, Operation, Closure and Post Closure Requirements for the Sanitary Landfills. Third Saudi Technical Conference & Exhibition, Riyad, December **2004**, **Paper # 701**.

c) Technical Reports

1) **Vohra**, **M.S.** (**Principal Author & Investigator**). TREATMENT OF PRETREATED PETROLEUM REFINERY WASTEWATER USING TiO_2 ASSISTED ADVANCED REDOX TECHNOLOGY. SABIC/2005-22, **Revised Final Report (2008)**.
2) **Vohra**, **M.S.** (**Principal Author & Investigator**). ENVIRONMENTAL EFFECTS OF WASTEWATER TREATMENT PLANTS: EVALUATION & GUIDELINES. KACST AR-25-78, **Revised Final Report** (**2009**).
3) **Vohra**, **M.S.** (**Principal Author & Investigator**). PRODUCTION OF GRANULAR ACTIVATED CARBON FROM DATE PALM TREE BRANCHES**.** KACST AR-26-23, **Revised Final Report** (**2010**).
4) **Vohra**, **M.S.** (**Principal Author & Investigator**). REMOVAL OF THIOCYANATE FROM SIMULATED INDUSTRIAL WASTEWATER USING PHOTOTALYSIS: EFFECT OF CO-POLLUTANTS, KFUPM FT 090009, **Revised Final Report** (**2011**).

d) Book Chapter

H. Hidaka, M. S. **Vohra**, N. Watanabe and N. Serpone, "Photocatalysis at solid/liquid interfaces – Photooxidation of mixed aqueous surfactants at the TiO_2/H_2O interface", published in Mixed Surfactant Systems, 2nd Ed., by M. Abe and J. F. Scamehorn, Surfactant Science Series, Volume 124, 769-793, Marcel Dekker Inc., December **2005**.

e) Patents

1) Photocatalyst, for decomposing or removing harmful substances, contains inorganic substance having opposite electric charge to substances to be treated. **Tanaka**, K., and **Vohra**, M.S. (Approved, Publication Year - **2002**). The information has been extracted from the **ISI** web of knowledge website titled '**Derwent Innovations Index**'.
2) Highly functional photocatalyst is partially covered with polymer having anionic groups on its surface. **Tanaka**, K., and **Vohra**, M.S. (Approved, Publication Year - **2003**). The information has been extracted from the **ISI** web of knowledge website titled '**Derwent Innovations Index**'.