
SUSHIL R. KANEL, Ph.D.

Senior Research Scientist

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HIGHLIGHTS

14 years' experience after Ph.D. in research and development work with proven accomplishments in physico-chemical treatment, nanomaterials and their application, mid-IR solid laser, mathematical modeling, grants writing, and contract management. Track record includes:

1. Experienced physical chemical treatment and nanotechnology expert with five patents, 45 publications in top-tier peer reviewed journals, 75 conference presentations, 20 invited talks, and six book chapters, >4,800 Citations with H-Index 25
2. Advised and assisted ~152 Air Force Institute of Technology (AFIT) faculty on proposal development including project scope, budget, and appropriate deliverables for ~800 proposals in FY15- FY19 (Total funding requested~ 100 M) and submitted the proposals to different sponsors (AFRL, US Army, WHCA, DHS, JWAC, NVIDIA, AFOSR etc.); Received over \$400,000 in research grants from DoD establishments as a PI and Co-PI
3. Advised MS (20) and PhD (3) students including nine military and civilian students in their thesis and research
4. Earned best Ph.D. thesis and best oral presentation awards for research excellence in application of nano-materials

EDUCATION

2006-2010 **Post-Doctoral Fellow**
Auburn University (AL) and Georgia Institute of Technology (GA)

2002-2006 **Doctor of Philosophy** (Environmental Science and Engineering)
Gwangju Institute of Science and Technology, Gwangju, South Korea

2000-2002 **Master's Degree** (Environmental Science and Engineering)
Gwangju Institute of Science and Technology, Gwangju, South Korea

1988-1992 **Bachelor of Engineering** (Civil)
Tribhuvan University, Kathmandu, Nepal

PROFESSIONAL EXPERIENCE

Jan-2020 - Present – Senior Research Scientist (Contractor) – Air Force Research Lab (AFRL)/RXAP-UES Inc, Wright-Patterson AFB, OH
R&D on nanomaterials; Mid-IR laser materials, Remediation; Fate and transport and modeling

Aug-2010 to Aug-2019 – Research Engineer and Scientist - AFIT, Wright-Patterson AFB, 2950 Hobson Way, Wright-Patterson AFB, 45433

1. Advised and assisted AFIT faculty on proposal development including project scope, budget, and appropriate deliverables for ~800 proposals in FY15 - FY19 (Total funding requested~ 100 M) and submitted the proposals to different sponsors (AFRL, US Army, WHCA, DHS, JWAC, NVIDIA, AFOSR etc.).
2. Served as a leadership and technical expert on various environmental issues related to DoD and US EPA
3. Guided several PhD and MS students in their research in the field of environmental science and engineering
4. Developed AOP and prepared Ag-TiO₂ glass thin films to treat emerging contaminants e.g. perfluorinated compounds (PFCs) and nitroaromatic compounds using UV and natural solar light
5. Designed 1-D column experiments and studied the fate and transport of silver nanoparticles (AgNP) in porous media
6. Developed online AgNP measurement system using UV spectrophotometer
7. Synthesized Ni/Pd coated nanoscale zero-valent iron (nZVI)
8. Delineated mechanism of chlorinated compound remediation using Pd/Ni-nZVI
9. Developed nanomaterial (Ag/Au-TiO₂) thin film for Photocatalysis of organic contaminants, explosives, and emerging contaminants using UV light and natural sunlight
10. Used X-ray absorption spectroscopy (XAS) to analyze AgNP and nZVI interacted with organic matter and different soil minerals
11. Wrote proposals and developed collaborative projects with USEPA (Cincinnati, OH) and several universities e. g. Wright State University (Fairborn, OH), Miami University (Oxford, OH), University of Cincinnati (Cincinnati, OH), Central State university (Wilberforce, OH) and University of Dayton (Dayton, OH), Guiding MS and PhD students from AFIT, Wright State University and The University of Toledo (OH) for their research in the field of environmental engineering
12. Served as a Program Manager to manage Oak Ridge Institute for Science and Education (ORISE)-AFIT research program. Assist PIs/mentors to select and appoint new ORISE participants to support AFIT research IAW ORISE and AFIT policies and procedures. Track/monitor the steps in the appointment process and facilitate/complete necessary documentation including request of support, manpower study, MIPR budget, selection form or selection update form, and certification of start
13. Prepared functionalized carbon nanotube (CNT) and CNT yarns to treat emerging contaminants e.g. perfluorinated compounds (PFCs), 1,2,3-Trichloropropane, and nitro-aromatic compounds

Aug-2009 to Aug 2010 – Senior Research Scientist (Contractor - Pegasus Technical Inc)- National Risk Management Research Laboratory, US Environmental Protection Agency (USEPA), 5995 Centre Hill Avenue, Cincinnati, OH 45224

1. Served as a leadership and technical expert on various environmental issues related to US EPA
2. Investigated the development and management of Superfund (USA) sites remediation strategies
3. Researched existing regulations and reviewed new and proposed regulations

4. Investigated transport pattern of nano ZnO through porous media
5. Studied on application of carbon coated nZVI in the remediation of PCBs contaminated soil
6. Prepared Standard Operating Procedures (SOPs), Health and Safety Plan (HASP) and Quality Assurance Plan (QAP) for different environmental projects

Aug-2006 to July-2009 – Post-Doctoral Fellow - School of Civil and Environmental Engineering, Georgia Institute of Technology (2008-2009), North Ave NW, Atlanta, GA 30332, and Department of Civil Engineering, Auburn University (2006-2008), 212 Harbert Engineering Center Auburn, AL 36849

1. Synthesis and application of nZVI for PCE-DNAPL treatment
2. Influence of Ni on PCE-DNAPL treatment
3. Designed 1-D column experiments to treat PCE-DNAPL
4. Developed a two-dimensional sand packed tank and investigated surface modified nZVI transport in these tanks
5. Synthesized different sizes of goethite coated sand and prepared hydroxyapatite from fish bones
6. Investigated interaction of goethite coated sand with U(VI) and As
7. Developed surface complexation models for the interaction of goethite coated sand with U(VI) and As
8. Co-supervised two MS and two PhD students
9. Analyzed groundwater pollutants in Nepal and developed mathematical models

Feb-1999 to Jul- 2006 - Graduate Research Assistant and Post-Doctoral fellow – School of Environmental Science and Engineering, Gwangju Institute of Science and Technology, Gwangju, South Korea

1. Synthesized nZVI before it was available commercially
2. Applied nZVI for As, Cr(VI), TCE, PCE treatments
3. Prepared steel byproducts such as steel slag for As treatment
4. Developed photocatalysts for organic contaminant treatment
5. Developed 1-D column experiments for the transport of nZVI and tested this technology for short term and long term conditions
6. Collected samples from different rivers and analyzed for chemical and physical parameters

Jan-1995 to Jan-1999 – Civil Engineer –Ministry of Local Development, His Majesty's Government, Nepal

1. Investigated the design and construction of water and wastewater treatment plants
2. Investigated the design and construction of civil engineering structures
3. Worked as a team leader to award projects to company and consultant
4. Worked in Ministry of Local Development and interacted extensively with public in local infrastructure development
5. Trained Civil and Environmental technicians
6. Worked as a part time lecturer to teach civil engineering courses e.g. surveying

Jan-1993 to Jan- 1995 – Civil and Environmental Engineer –Nepal Consult Pvt. Ltd., Nepal

1. Investigated environmental road structures and their environmental impacts
2. Carried out design, construction, and environmental study of hydropower plant (Naugarh Gad Small Hydropower Project (1.8 MW), Darchula District, Nepal)

AWARDS, FELLOWSHIP AND RECOGNITION

1. *Best Poster Award for a MS student* Mr. Morgan Russel in ASCE-EWRI **2017**, Sacramento CA
2. *Champion ENR Quarterly Teambuilding Award from AFIT, Wright-Patterson AFB OH* (contribution to the ORISE Contract as a Program Coordinator in **2015**)
3. *7th Most-Accessed and Downloaded Article from Science Direct* (contribution to the Coordination Chemistry Reviews in **2015**)
4. *Listed in Who's Who in America*, 9th Edition, NJ, USA, **2015**
5. *Excellence in Reviewing Journals in Springer* (Clean Technologies and Environmental Policies), USA, **2013**
6. *The National Academies Award - National Research Council Research-Associateship at the AFIT, Wright Patterson Air Force Base, OH, 2010-2012*
7. *Certificate of Appreciation* in recognition of contribution to GIST by having published outstanding papers in environmental science and engineering, Gwangju, South Korea, **2008**
8. *Best Poster Award - Environmental Institute, Auburn University Earth Day Poster Competition, AL, 2007*
9. *Best Research Award for Outstanding Performance in Research for a Ph.D. Dissertation* in Environmental Science and Engineering by Korea Atomic Energy Research Institute, South Korea, **2006**
10. *Most-Accessed and Downloaded Article contribution to the Journal Environmental Science and Technology* (American Chemical Society (ACS) [the whole year **2005** - 6th position]
11. *Best Oral Presentation Award* by Korea Society of Environmental Engineers, South Korea, **2005**
12. *Korea Government Fellowship* for M. Sc. (**1999-2001**) and Ph.D. (**2001-2006**), South Korea
13. *Research featured* in: Environment Progress (03/2013), Military Engineer News (01/2011), The Eco Journal News (01/08), Chum-dan Net News (01/2008), Dong Broadcasting System TV news (06/2007), USEPA report (02/2007), Money Today (04/2006), Gwangju Mail News (10/2005), Environmental Science and Technology (ACS journal) News (06/2005), Nanotechnology Research News (ivcon.net, 03/2005); Gwangju Institute of Science and Technology News (03/2005)

PATENTS

1. Choi, H. and Kanel S. R. Iron nanoparticles (NPs) composite and preparation thereof (Patent No.10-0633308-00-00 South Korea).
2. Choi, H. and Kanel S. R. Mobile reactive barrier and in situ remediation of soil or groundwater (Patent No.10-0644164-00-00 South Korea).
3. Choi, H, Giasuddin, A. B. M., and Kanel, S. R. A novel method of synthesis of air-stable zero-valent iron nps at room temperature and their application for groundwater remediation

(Patent Priority No.10-2006-0101079 USA).

4. Choi, H. and Kanel S. R. Method for synthesis of zero-valent iron nanowires and its application for groundwater treatment (Patent No.10-2006-0112218 USA).
5. Choi, H, Ryu, A., Han, S., and Kanel, S. R. Surfactant coated bimetallic iron nps (Patent Application No: 10-2006-0101078 South Korea).

PUBLICATIONS

(Citations downloaded from google scholar) 1 Aug 20, H- Index; 25, Overall Citations >4950)

1. Malakar A, **Kanel, S. R.**, Ray, C., Snow, D D., Nadagouda M., Nanomaterials in the Environment, Human Exposure Pathway, and Health Effects: A Review, *The Sci of Tot Environ*, **2020** (Impact factor: 6.5, Citation: NA) (In Press)
2. Kurwadkar, **S, Kanel**, S.R., Nakarmi A, Groundwater Pollution: Occurrence, Detection, and Remediation of Organic and Inorganic Pollutants, *Water Environ Res*, **2020** (doi.org/10.1002/wer.1415) (Impact factor: 1.2, Citation: 2)
3. Nakarmi A, Rebecca M., Shawn B, Ruth L., **Kanel, S. R.**, Nadagouda M., Kumar, P., Pavel I., Viswanathan T, Modified Biochar Nanocomposites for Phosphate Remediation from Contaminated Water, *J. of Water Environmental Federation*, **2020**, 272,111048 (Impact factor: 2.5, Citation: NA)
4. Duanghathaipornsuk, **S.; Kanel**, S.; Haushalter, E.F.; Ruetz, J.E.; Kim, D.-S., Detection of Hydroxyl Radicals Using Cerium Oxide/Graphene Oxide Composite on Prussian Blue, *Nanomaterials*, **2020**, 10, 1136 ((Impact factor: 4.5, Citation: NA)
5. Edwards C., Duanghathaipornsuk S., Goltz M., Kanel, S., Kim DS., Peptide Nanotube Encapsulated Enzyme Biosensor for Vapor Phase Detection of Malathion, an Organophosphorus Compound, *Sensors*, **2019**, 19, 3856 ((Impact factor: 3, Citation: 1)
6. Manning B., **Kanel, S. R.**, Guzman, G., Brittle, S. W., Sizemore, I., Oxidative dissolution of silver nanoparticles by synthetic manganese dioxide investigated by synchrotron X-ray absorption spectroscopy, *J. Nanoparticle Res*, **2019** 21,272 (Impact factor: 3.3, Citation: 1)
7. Rashid, U.S., Pate, M.F., Simsek, S., **Kanel, S. R.**, Bezbaruah, A.N., Investigation of novel natural starch stabilized iron nanoparticles for colloidal stability and nitrate treatment, *Environmental Technology & Innovation - Journal* , **2019**, 1, (In Press), (Impact factor: 2, Citation: 1)
8. Kurwadkar, S., Hoang, T.V., Malwade, K., **Kanel, S. R.**, Harper, W., Struckhoff, G. Application of Carbon Nanotubes for Removal of Emerging Contaminants of Concern in Engineered Water and Wastewater Treatment Systems, *Nanotechnology for Environmental Engineering*, **2019** 4,12 (Impact factor:6.1, Citation: 1)
9. Russell, M., Kempisty, D., **Kanel, S. R.**, Kurwadkar,S., Brittle, S. W., Sizemore, I., Yaal, L. Destruction of aqueous phase organic pollutants using ultraviolet light emitting diodes and photocatalysis, *Water Air Soil Pollution*, 229, 139 **2018** (Impact factor: 1.8, Citation: 2)
10. **Kanel, S. R.** and Choi H. Removal of Arsenic from Groundwater by Industrial byproducts and its comparison with Zero-Valent Iron, *J Hazardous Toxic & radioactive Waste (ASCE)*21(3) 1-7 **2017** (Impact factor: 0.8, Citations: 10)
11. Pokhrel, L, Ettore, N., Jacobs, Z.L., Zarr, A., Weir, M.H., Scheuerman, **S. R. Kanel** and Dubey R. Novel carbon nanotube (CNT)-based ultrasensitive sensors for trace mercury

- (II) detection in water: A review, *Sci of The Total Environ* 574 1379-1388 **2017** (Impact factor: 3.9, Citations: 42)
12. **Kanel, S. R.**, Misak H., Nepal, D., Mall, S., Brittle, S. W., Sizemore, I., Kempisty, D., Goltz, M. The use of carbon nanotube yarn as a filter medium to treat nitroaromatic-contaminated water, *New Carbon Materials*, 31:4, 415-423, **2016** (Impact factor: 1.3, Citation: 8)
 13. Varshney, G., **Kanel, S. R.**, Kempisty, D, Varshney, V., Agrawal A., Sahle-Demessie, E., Varma, R.S., Nadagouda, M.N. Nanoscale TiO₂ films and their application in remediation of organic pollutants: *Coordination Chem Rev*, 306, 43-64, **2016** (*Most Accessed downloaded from Science Direct in Aug-Oct-2015* (Impact factor: 12.6, Citation: 77)
 14. **Kanel, S. R.**, Flory J., Meyerhoefer, A., Fraley J. L., Sizemore, I. E., Goltz, M. Influence of natural organic matter on fate and transport of silver nanoparticles in saturated porous media: laboratory experiments and modeling, *J of Nanoparticle Res*, 17, 1-13, **2015** (Impact factor: 3.3, Citation: 18)
 15. Park K., Biswas, S., **Kanel S. R.**, Nepal D., Vaia R. A. Engineering the Optical Properties of Gold Nanorods: Independent tuning of surface plasmon energy, extinction coefficient and scattering cross-section, *The J of Phys Chem C*, 118 (11), 5918-5926, **2014** (Impact factor: 4.8, Citations: 60)
 16. Dorney, K.M., Baker, J.D., Edwards, M.L., **Kanel, S.R.**, O'Malley, M., Sizemore I. P. Tangential Flow Filtration of Colloidal Silver Nanoparticles: A "Green" Laboratory Experiment for Chemistry and Engineering Students, *J Chem Edu*, 91, 1044–1049, **2014** (Impact factor: 1.0, Citations: 33)
 17. **Kanel, S. R.**, Malla G., Choi H. Modeling and study of the mechanism of mobilization of arsenic contamination in the groundwater of Nepal in South Asia, *Clean Tech & Environ Policy*, 15, 1077-1082, **2013** (Impact factor: 1.8, Citations: 6)
 18. Flory J., **Kanel, S. R.**, Racz L., Impellitteri C. A., Silva R. G., Goltz, M. Influence of pH on the transport of silver nanoparticles in saturated porous media: laboratory experiments and modeling, *J. Nanoparticle Res*, 15, 1-11, **2013** (Impact factor: 3.3, Citation: 32)
 19. Chattanathan S. A., Clement T. P., **Kanel S. R.**, Barnett M. O. and Chatakondi N. Remediation of uranium-contaminated groundwater by sorption onto hydroxyapatite derived from catfish bones, *Water, Air & Soil Pollution*, 244, 1-9, **2013** (Impact factor: 1.8, Citations: 21)
 20. Swarnakar P., **Kanel, S. R.**, Nepal D., Jiang Y., Jia H., Kerr L., Goltz M. N., Levy, J., Rakovan, J. Silver deposited titanium dioxide thin film for photocatalysis of organic compounds using natural light, *Solar Energy*, 88, 242–249, **2013** (Impact Factor: 2.9, Citations: 46)
 21. **Kanel, S. R.**, Goltz, M. N. Treating Groundwater with Nanotechnology (**2011**), *Military Engineer* 103, 67-6, 2011 (Impact factor: 0, Citation: 0)
 22. **Kanel, S. R.**, Clement T. P., Barnett M. O., and Goltz, M. N. Nano-scale hydroxyapatite: synthesis, two-dimensional transport experiments and application for uranium remediation, *J. of Nanotechnology* 2011, 1-5, **2011** (Impact factor: NA, Citations: 0)
 23. **Kanel, S. R.** and Al-Abed, S. Influence of pH on the transport of nanoscale zinc oxide in saturated porous media, *J. Nanoparticle Res*, 13, 4035-4047, **2011** (Impact factor: 3.3, Citation: 77)
 24. Kannel, P. R., **Kanel, S. R.**, Lee, S., Lee, Y. S., and Gan, T. Y. A review of public domain water quality models for simulating dissolved oxygen in rivers and

- streams, *Environmental Modeling & Assessment*, 16, 183-204, **2011** (Impact factor: 0.97, Citation: 73)
25. Kannel, P. R., **Kanel, S. R.**, Lee S., and Lee Y. S. Chemometrics in assessment of seasonal variation of water quality in fresh water systems, *Environmental Modeling & Assessment*, 174, 529-545, **2011** (Impact factor: 0.97 , Citation: 21)
 26. Loganathan, V. A., Barnett, M. O., Clement, T. P., and **Kanel, S. R.** Scaling of adsorption reactions: U(VI) experiments and modeling, *Applied Geochemistry*, 24, 2051-2060, **2009** (Impact factor: 2.6, Citation: 17)
 27. Hartzog O. K., Loganathan, V. A., **Kanel, S. R.**, Jeppu, G. R., and Barnett, M. O. Normalization, comparison, and scaling of adsorption data: Arsenate and goethite, *J. Colloid & Interface Science*, 333, 6, **2009** (Impact factor: 3.1, Citation: 13)
 28. Wang Q. L., **Kanel S. R.**, Park H., Ryu A. and Choi, H. Controllable synthesis, characterization, and magnetic properties of nanoscale zerovalent iron with specific high Brunauer-Emmett-Teller surface area, *J. Nanoparticle Res*, 11, 749-755, **2009** (Impact factor: 3.3, Citation: 51)
 29. **Kanel, S. R.**, Goswami, R., Clement, T. P., Barnett, M. O., and Zhao, D. Two dimensional transport characteristics of surface stabilized zero-valent iron nanoparticles in porous media, *ES&T*, 42, 896–900, **2008** (**Impact factor: 5.5, Citation: 212**)
 30. **Kanel, S. R.**, Nepal, D., Manning, B., and Choi, H. Transport of surface-modified iron nanoparticle in porous media and application to arsenic(III) remediation, *J. Nanoparticle Research*, 9, 725–735, **2007** (**Impact factor: 3.3, Citation: 255**)
 31. Giasuddin, A. B. M., **Kanel, S. R.**, and Choi, H. Adsorption of humic acid onto nanoscale zerovalent iron and its effect on arsenic removal *ES&T*, 41, 2022-2027, **2007** (**Impact factor: 5.4, Citation: 487**)
 32. Kannel, P. R., Lee, S., Lee, Y.-S., **Kanel, S. R.**, and Khan, S. P. Application of water quality indices and dissolved oxygen as indicators for river water classification and urban impact assessment, *Environmental Monitoring and Assessment*, 132, 93-110, **2007** (Impact factor: 0.97, Citation: 345)
 33. Kannel, P. R., Lee, S. H., **Kanel, S. R.**, Lee, Y. S., and Ahn, K. H. Application of QUAL2Kw for water quality modeling and dissolved oxygen control in the river Bagmati, *Environmental Monitoring Assessment*, 125, 201-217, **2007** (Impact factor:0.97, Citation: 56)
 34. Kannel, P. R., Lee, S. **Kanel, S. R.**, Khan S.P. and Lee, Y. S. Spatial-temporal variation and comparative assessment of water qualities of urban river system: A case study of the River Bagmati (Nepal), *Environmental Monitoring Assessment*, 129, 433-459, **2007** (Impact factor: 0.97, Citation: 125)
 35. Kannel, P. R., Lee, S., Lee, Y. S., **Kanel, S. R.**, and Pelletier, G. J. Application of automated QUAL2Kw for water quality modeling and management in the Bagmati River, Nepal, *Ecological Modeling*, 202, 503-517, **2007** (Impact factor: 2.7, Citation: 176)
 36. **Kanel, S. R.** and Choi, H. The transport characteristics of polymer stabilized nano scale zero-valent iron in porous media, *Water Sci & Tech*, 55, 157-162, **2007** (Impact factor: 1.1, Citation: 94)
 37. Manning, B. A., Kiser J. R., Kwan, H. and **Kanel, S. R.** Spectroscopic investigation of Cr(III) and Cr(VI) treated nanoscale zero-valent iron, *ES&T*, 41, 586-592, **2007** (**Impact factor: 5.5, Citation: 250**)
 38. Kannel, P. R., Lee, S. H., **Kanel, S. R.**, and Khan, S. P. Chemometric application in

- classification and assessment of monitoring locations of an urban river system, *Analytica Chimica Acta*, 582, 390-399, **2007 (Impact factor: 4.5, Citation: 265)**
39. **Kanel, S. R.**, Grenèche, J.-M., and Choi, H. Arsenic (V) Removal from groundwater using nano scale zero-valent iron as a colloidal reactive barrier material, *ES&T*, 40, 2045-2050, **2006 (Impact factor: 5.5, Citation: 704)**
 40. **Kanel, S. R.**, Kim, J.-Y., Vigneswaran, S., Shim, W. G. and Choi, H. Removal of arsenic(III) from groundwater using low-cost industrial byproducts-blast furnace slag, *Water Qual. Res. J. Canada*, 41, 130-139, **2006** (Invited paper) (Impact factor: 0.71, Citation: 62)
 41. **Kanel, S. R.**, Manning, B., Charlet, L., and Choi, H. Removal of arsenic(III) from groundwater by nano scale zero-valent iron, *Environmental Science and Technology*, 39, 1291-1298, **2005** (This article was the **6th most accessed and downloaded article in ES&T for all of 2005**) (**Impact factor: 5.5, Citation:1118**)
 42. **Kanel, S. R.**, Neppolian B., Jung, H., and Choi, H. Comparative removal of polycyclic aromatic hydrocarbons using iron oxide and hydrogen peroxide in soil, *Environ Eng Sci*, 21, 741-751, **2004** (Impact factor: 1.2, Citation: 35)
 43. Neppolian, B., **Kanel, S. R.**, Choi, H. C., Sakthivel, S., Arabindoo, B., and Murugesan, V. Photocatalytic degradation of reactive yellow 17 dye in aqueous solution in the presence of cement binder, *International Journal of Photoenergy*, 5, 45-49, **2003** (Impact factor: 2.7, Citation: 60)
 44. **Kanel, S. R.**, Neppolian, B., Choi, H., and Yang, J. W. Heterogeneous catalytic oxidation of phenanthrene by hydrogen peroxide in soil slurry: kinetics, mechanism and implication, *Soil and Sediment Contamination: an International Journal*, 12, 101-117, **2003** (Impact factor: 0.89, Citation: 77)

BOOK CHAPTERS AND BOOKS

BOOKS

1. **Kanel, S. R.**, Mathisen, P, Bezbaruah (Editors), A., Nanotechnology based drinking water treatment development for residential areas, (In Preparation), **2021**

BOOK CHAPTERS

2. **Kanel, S. R.**, Nadagouda, M. Book Chapter: Health and safety of Surface Modified Nanomaterials, in Book: Surface Modified Nanomaterials for Applications in Catalysis Eds: Mukhopadhyay, S. M., *Wiley, London, UK*, **2021**
3. Nakarmi A., **Kanel, S. R.**, Viswanathan T. Nanomaterials application for phosphate remediation from wastewater, (*In Preparation*), *Elsevier* **2021**
4. Nepal D., **Kanel, S. R.**, Drummy L.F. Hierarchical Assembled Structures based on NPs: Structure-Property Relations and Advanced Three-Dimensional Characterization, (*In Press*), **2019**
5. Zarr A., Pokhrel, L., **Kanel, S. R.** Carbon nanotube (CNT)-based novel sensors for mercury (II) detection in water, *Nanotechnology In Food Industry (Multi-Volume SET) - Elsevier*, **2015**

6. **Kanel, S. R.**, Su, C., Patel, U., and Agrawal, A. Nanoscale Multifunctional Materials: Science & Applications of Metal Nanoparticles in Environmental Cleanup, Eds: Mukhopadhyay, S. M., *Wiley, London, UK, 2011*
7. **Kanel, S. R.** and Nepal, D. Nanotechnologies for Water Environment Applications, “Nanoscale Porous Materials for Water Treatment”. Eds: Zhang, Tian C; Surampalli, Rao Y.; Lai, Keith C. K.; Hu, Zhiqiang; Tyagi, R. D.; Lo, Irene M. C. *American Society of Civil Engineers, USA, 2009*
8. Park, H., **Kanel S. R.**, and Choi, H. Environmental Applications of Nanoscale and Microscale Reactive Metal Particles, Chapter 8 “Arsenic Removal by Nano-scale Zero Valent Iron and how it is Affected by Natural Organic Matter”, *American Chemical Society (ACS), Washington, DC, USA, 2009*
9. **Kanel, S. R.** and Choi, H. Natural arsenic in groundwaters of Latin America, “Arsenic remediation from Groundwater by Environmentally Reactive Iron Nano Particles”. Eds: Bundschuh, J. and Bhattacharya P., *Taylor and Francis (Balkema), London, UK, 2008*

GRANTS (FUNDED)

10. **2020-2023:** Mid-IR solid laser glass funded by AFRL, US\$ 324,000 (Investigator-Contactor).
11. **2020-2022:** Engineered Lightweight Composites for Improved Mechanical and EMI Shielding Properties: Experimental and Analytical Approaches funded by NRO, AS&T DC, US\$ 31,000 (Investigator-Contactor).
12. **2020-2021:** Engineered Mid IR solid laser: Synthesis and Application funded by AFRL/XRAP, US\$ 108,000 (Principal Investigator-Sub-Contactor).
13. **2015-2016:** Removal of perfluorinated compounds using conventional and advanced adsorbents in batch and flow-through columns funded by Wright Patterson AFB (WPAFB), US\$ 22,189.00 (Co-PI-funded).
14. **2014-2015:** Development of carbeneous adsorbents for water treatment, funded by Air Force Institute of Technology, Wright Patterson AFB, US\$ 23,700.00 (Co-PI-funded).
15. **2014-2015:** Use of carbon nanotube yarns to remediate groundwater contaminants of DoD concern: kinetics, isotherms, and redox transformations; Department of Defense (DoD), Defense Environmental Restoration Program Wright Patterson AFB (WPAFB), US\$ 91,400.00 (PI-funded)
16. **2013-2014:** Development of novel DoD concerned contaminants treatment technology using photocatalysis in the presence of nanocatalysts and solar light; Department of Defense (DoD), Defense Environmental Restoration Program Wright Patterson AFB (WPAFB), US\$ 85,199.00 (PI-funded)
17. **2013-2014:** Nerve gas detection using enzymes encapsulated within peptide nanotubes funded by The Air Force Medical Support Agency (AFMSA), US\$ 52,000.00 (Co-PI-funded).
18. **2013-2014:** Photocatalytic oxidation to treat perfluorinated compound-contaminated water funded by Wright Patterson AFB (WPAFB), US\$ 15,000.00 (Co-PI-funded).
19. **2012-2013:** by Department of Defense (DoD), Defense Environmental Restoration Program, Wright Patterson AFB (WPAFB), US\$ 60,000.00 (PI-funded)

20. **2011-2012:** Fate and transport of nano silver in groundwater funded by Office of the Air Force Surgeon General, US\$ 79,245.00 (Co-PI-funded).
21. **2010-2012:** Development of a novel sustainable energy-efficient nanotechnology for water treatment, funded by Air Force Institute of Technology, Wright Patterson AFB, US\$ 24,500.00 (Co-PI-funded).
22. **2010-2011:** Fate and transport of nano silver in groundwater funded by Office of the Air Force Surgeon General, US\$ 70,370.00 (Co-PI-funded).
23. **2011: Travel Fund** - For attending “Gordon Research Conference” Waterville Valley, NH, (\$600)
24. **2001-2005:** Arsenic release mechanism study in Nepal, funded by IERC, Gwangju Institute of Science and Technology (GIST), US\$ 20,000.00 (funded).

MENTORING EXPERIENCE

1. **Thesis Committee** of Perveen Kumar (Ph.D. Student) from Wright State University, Dayton OH. Thesis title: “*Nanomaterials-Environment (TBD)*”. 2019-2023.
2. **Thesis Committee** of Kai Irvin (MS Student) from Wright State University, Dayton OH. Thesis title: “*Transformation water contaminants by nano zero-valent iron*”. 2017-2018.
3. **Thesis Committee** of Seth Brittle (Ph.D. Student) from Wright State University, Dayton OH. Thesis title: “*Transformation and Bioavailability of anthropogenic Silver in the Freshwater Environment*”. 2014-2017.
4. **Thesis Committee** of Captain Chrostopher Brown (MS Student) from Air Force Institute of Science and Technology, Wright-Patterson AFB, OH. Thesis Title: “*Application of Carbon Nanotube Materials to Treat Emerging Contaminants (Perfluorinated Compounds)*”. 2015-2017.
5. **Thesis Committee** of Morgan Russell (MS Student) from Air Force Institute of Science and Technology, Wright-Patterson AFB, OH. Thesis Title: “*Application of Photocatalysis for Water Treatment*”. 2015-2017
6. **Thesis Committee** of Benjamin Doane (MS Student) from Air Force Institute of Science and Technology, Wright-Patterson AFB, OH. Thesis Title: “*Application of Carbon Nanotube-yarn to treat water contaminants of DOD concern*”. 2014-2015.
7. **Thesis Committee** of Shirin Ghahghaei (MS Student) from Wright State university, OH. Thesis Title: “*Assessing the Reactivity of Iron Monosulfide for the Treatment of Ground Water Pollutants*”. 2014-2015.
8. **Research Co-Mentor** of Tala Ebrahimian, Cody Fourman and Emily Artz (undergraduate students) from Wright State University, Dayton OH on “Application of nanomaterials for water treatment”. 2015.
9. **Thesis Committee and Research Co-Mentor** of Jessica Fraley (MS Student) from Department of Chemistry, Wright State University, OH. Thesis title: “*Interaction of AgNP and natural organic matter: Raman/SERs investigations*” 2013-2014.
10. **Thesis Committee** of Captain Mario Tellez (MS Student) from Air Force Institute of Science and Technology, Wright-Patterson AFB, OH. Thesis Title: “*Fate and transport of silver nanoparticles through different size sand packed column*”. 2013-2014.
11. **Thesis Committee** of Major Christopher Edwards (MS Student) from Air Force Institute of Science and Technology, Wright-Patterson AFB, OH. Thesis Title: “*Fate and transport of silver nanoparticles through different size sand packed column*”. 2013-2014.

12. **Research Co-Mentor** of Allie Meyerhoefer (undergraduate student) from Wright State University, Dayton OH. Research title: “*Photocatalysis and silver nanoparticle transport through porous media*” 2012-2014.
13. **Research Co-Mentor** of Nicole Jacques (undergraduate student intern) from Maimi University, Oxford, OH in Air Force Institute of Science and Technology, Wright-Patterson AFB, OH. 2013-2014.
14. **Thesis Committee** of Jessica Dagher (MS Student) from Wright State University, Dayton OH. Thesis title: “*Fate and transport of silver nanoparticles and their modeling*”. 2011-2012.
15. **Thesis Committee** of Major Meidinger Travis (MS Student) from Air Force Institute of Science and Technology, Wright-Patterson AFB, OH. Thesis Title: “*Fate and transport of silver nanoparticles through different size sand packed column*”. 2011-2012.
16. **Thesis Committee** of Captain Jason Flory (MS Student) from Air Force Institute of Science and Technology, Wright-Patterson AFB, OH. Thesis Title: “*Influence of pH on the transport of silver nanoparticles in saturated porous media: laboratory experiments and modeling*”. 2010-2011.
17. **Thesis Committee** of Captain Todd Stevens (MS Student) from Air Force Institute of Science and Technology, Wright-Patterson AFB, OH. Thesis Title: “*Stabilizing acetylcholinesterase on carbon electrodes using peptide nanotubes to produce effective biosensors*”. 2010-2011.
18. **Thesis Committee** of Prakash Suwarnkar (MS Student) from Miami University, Oxford, OH. Thesis Title: “*Development of novel sustainable and energy efficient nanotechnology for water treatment*”. 2010-2011.
19. **Research Co-Mentor** of Allie Meyerhoefer (undergraduate student) from Wright State University on “*Photocatalysis and silver nanoparticle transport through porous media*” 2012.
20. **Research Co-Mentor** of Vijay Loganathan (Graduate Student) Department of Civil Engineerin, Auburn University “*Interaction of U(VI) with iron oxide coated sand and their surface complexation modeling*” 2006-2008.
21. **Research Co-Mentor** of Gautham Jeppu (Graduate Student) Department of Civil Engineerin, Auburn University “*Interaction of arsenic with iron oxide coated sand and their surface complexation modeling*” 2006-2008.
22. **Research Co-Mentor** of Anna Ryu, Abul Giasuddin, Qiliang Wang (Graduate Student) of Gwangju Institute on “*Synthesis of nanoscale zero-valent iron and their application for arsenic treatment*” 2005-2006.

TEACHING EXPERIENCE

1. Co-teaching (*Adjunct faculty*) *Remediation Design & Management (ENVR 772)* Graduate Course, Wright State university, Dayton OH, Fall 2011, 2012, 2013, 2014, 2015, 2016,2017, 2018, 2019, and 2020
2. Co-taught *Experimental Nanomaterials and Nanoscience (ME/CHM 4680 and 6680)*, *One-Dimensional Transport of Silver Nanoparticles in a Saturated Porous Media*, Graduate and Undergraduate Course, Wright State University, Dayton OH, Fall 2013
3. Invited lectures at South Dakota State University, *Groundwater Remediation (CE 499/696)*. Graduate course, Fall 2011, 2012, 2013, and 2014
4. *Individually taught (Adjunct faculty) Water Supply (ENE 4415)* Undergraduate Course,

- Central State University, OH, spring 2011
5. Co-taught *Environmental System Engineering (ENVR 550)*, Graduate Course, Air Force Institute of Technology, Wright Patterson Air Force Base, Dayton OH, Fall 2011
 6. Invited lectures at South Dakota State University, *Groundwater Remediation (CE 499/696)*. Graduate course, 2011
 7. Teaching Assistant at Gwangju Institute of Science and Technology (GIST), South Korea, Graduate Course *Environmental Chemistry* - Fall 2004

PRESS/NEWS COVERAGE (Selected from several websites)

1. *Military Magazine News* on Water Treatment using Nanotechnology (Kanel and Goltz (2011)) (January-February 2011) (*Treating groundwater with nanotechnology*)-AFIT scientists developed different types of nanoscale zero-valent iron (NZVI). The nZVI can be used to treat groundwater contaminants *in-situ* so that excavation method can be avoided)
2. *Sixth Most Access Downloaded Journal of 2005 in Environmental Science and Technology*(ACS journal)(Kanel et. al (2005), Environmental Science and Technology) Phys.Org - <http://phys.org/news134652009.html> (June 2008)
(“*Removal of arsenic (III) from groundwater by nano scale zero-valent iron* - Nanoscale zero-valent iron (NZVI) was synthesized and tested for the removal of As (III), which is a highly toxic, mobile, and predominant arsenic species in anoxic groundwater. We used SEM-EDX, AFM, and XRD to characterize particle size, surface morphology, and corrosion layers formed on pristine NZVI and As (III)-treated NZVI. AFM results showed that particle size ranged from 1 to 120 nm. XRD and SEM results revealed that NZVI gradually converted to magnetite/maghemite corrosion products mixed with lepidocrocite over 60 d. Arsenic(III) adsorption kinetics were rapid and occurred on a scale of minutes following a pseudo-first-order rate expression with observed reaction rate constants (k_{obs}) of 0.07-1.3 min⁻¹ (at varied NZVI concentration). These values are about 1000 x higher than k_{obs} literature values for As (III) adsorption on micron size ZVI”)

INVITED TALKS

1. **Kanel, S. R.** *Department of Paper and Chemical Engineering, Miami University:* Investigations of nanomaterials for water treatment: current trend and future perspectives: Research Presentation as a Guest Speaker, Oxford, OH, September 8, **2020**.
2. **Kanel, S. R.** *Department of Chemistry, Wright State University:* Application of Nanomaterials for Water Treatment: Current Trend and Future Perspectives as a Guest Speaker, Dayton, OH, February 14, **2020**.
3. **Kanel, S. R.** *7th Microsymposium on Applied Sciences [Nano/Bio] organized by Tribhuvan University,* Application of Nanomaterials for Drinking Water Treatment, Kathmandu Nepal, December 28, **2019**.
4. **Kanel, S. R.** *School of Engineering, Seoul National University, South Korea,* Applications and implications of carbon and iron nanomaterials for water treatment, LA, USA, June 25, **2019**.
5. **Kanel, S. R.** *College of Agricultural, Environmental and Natural Sciences, Tuskegee University,* Synthesis and Application of Nanomaterials for Water Treatment: Distinguished Lecture, Tuskegee, AL, USA, November 18, **2016**.

6. **Kanel, S. R.** Department of Earth and Environmental Engineering, Wright State University: Nano Technology for Groundwater Remediation: Research Presentation as a Guest Speaker, Dayton, OH, November 18, **2015**.
7. **Kanel, S. R.** *Department of Chemistry, Tribhuvan University*: Synthesis and Application of Nanomaterials for Water Treatment: Research Presentation as a Guest Speaker, Lalitpur, Nepal, December 12, **2014**.
8. **Kanel, S. R.** *Department of Civil Engineering, North Dakota State University*: Application of Engineered Iron Nano Materials for arsenic treatment: Research Presentation as a Guest Speaker, Fargo, ND, October 31, **2013**.
9. **Kanel, S. R.** *Department of Chemistry, Wright State University*: *One-Dimensional Transport of Silver Nanoparticles in a Saturated Porous Media*: Research Presentation as a Guest Speaker, Dayton, OH, October 1, **2013**.
10. **Kanel, S. R.** *Department of Paper and Chemical Engineering, Miami University*: Nanoparticles: applications for groundwater remediation and implications: Research Presentation as a Guest Speaker, Oxford, OH, April 26, **2013**.
11. **Kanel, S. R.** *Department of Civil Engineering, North Dakota State University*: Engineered Iron Nano Materials: Applications and implications: Research Presentation as a Guest Speaker, Fargo, ND, November 5, **2012**.
12. **Kanel, S. R.** *Department of Civil Engineering, North Dakota State University*: Engineered Iron Nano Materials: Fate, their Application in Groundwater Treatment and Transport: Research Presentation as a Guest Speaker, Fargo, ND, May 3, **2012**.
13. **Kanel, S. R.** *Department of Engineering and Environmental Management, Air Force Institute of Technology (AFIT)/ENV*: Application and implication of Nanotechnology in our environment: Research Presentation as a Guest Speaker, Dayton, OH, October 28, **2011**.
14. **Kanel, S. R.** *School of Chemical and Environmental Engineering, Toledo University*: Engineered nano materials: fate, transport and their application in soil and water treatment: Research Presentation as a Guest Speaker, Toledo, OH, USA, May 3, **2011**.
15. **Kanel, S. R.** *Department of Biological and Agriculture Engineering, University of Georgia*: Use of nanoscale zero-valent iron for the remediation of environmental contaminants in ground water, Griffin, Athens, GA, USA, February 25, **2008**.
16. **Kanel, S. R.** *Department of Geosciences, Georgia State University*: "Application of Nanotechnology for Groundwater Treatment" Atlanta, GA, USA, February 28, **2008**.
17. **Kanel, S. R.** *College of Agricultural, Environmental and Natural Sciences, Tuskegee University*, Application of iron nano materials in the field of environmental remediation, agriculture and animal science: *Distinguished Lecture*, Tuskegee, AL, USA, February 8, **2008**.
18. **Kanel, S. R.** *School of Civil & Environmental Engineering, Georgia Institute of Technology*: Application of iron nanoparticles for water treatment: Research Presentation as a Guest Speaker, Atlanta, GA, USA, January 28, **2008**.
19. **Kanel, S. R.** *Department of Civil Engineering, Auburn University*: Application of iron nano particles for groundwater remediation: Research Presentation, Auburn, AL, USA, March 7, **2007**.
20. **Kanel, S. R.** *The Korean Society for Applied Biological Chemistry*: Reactive Nano Particles for Environmental Application: Removal of Arsenic and Trichloroethylene: Research Presentation, Chonnam University, Gwangju, South Korea, April 21, **2006**.

CONFERENCE PROCEEDINGS (Underlined is the presenter)

1. Aryal, S and **Kanel, S. R.**, Water parliament, a case study of integrated water resource management committee and water policy in Nepal, Environmental & Water Resources Institute (EWRI) Congress Conference, Pittsburgh, PA, May 19-23, **2019**.
2. Manning B., **Kanel, S. R.**, Guzman, E., Sizemore, I., Seth Brittle, Silver nanoparticle stability and oxidative dissolution by metal oxide soil minerals, 256th ACS National Meeting, Orlando, FL, USA, March 31 - April 4, **2019**.
3. **Kanel, S. R.**, Sizemore, I., Kempisty, D, Goltz, M, Treatment of nitroaromatic explosives-contaminated water in aqueous phase by nano-sized carbon nanotube yarn, 255th ACS National Meeting, New Orleans, LA, USA, March 18-22, **2018**.
4. Russell, M., **Kanel, S. R.**, Kempisty, D., Nano-sized TiO₂ thin film synthesis and characterization on quartz slides, borosilicate beads and quartz cylinders for use in photocatalytic degradation of organic contaminants, 253rd ACS National Meeting, San Francisco, CA, April 2-6, **2017**.
5. Russell, M., **Kanel, S. R.**, Kempisty, D., Low-cost, low power technology to destroy organic pollutants in water: ultra-violet light emitting diodes and photocatalysis, Environmental & Water Resources Institute (EWRI) Congress Conference, Sacramento CA, May 22-25, **2017**.
6. **Kanel, S. R.**, Al-Abed S., Fate and Transport of nanoscale zinc oxide in subsurface environment, 253rd ACS National Meeting, San Francisco, CA, April 2-6, **2017**.
7. Doane B., **Kanel, S. R.**, Fourman, C., and Kempisty, D., Goltz, M.N. Investigation of Nano-Carbonaceous Material to Treat Nitroaromatic Compound Contaminated Water, *Environmental & Water Resources Institute (EWRI) Congress Conference, Miami FL, USA, May 22-26, 2016*.
8. **Kanel, S. R.**, Neppolian B. Diffused solar light assisted total degradation of organic pollutants using graphene oxide supported metal oxide photocatalysts with ultrasound, *Environmental & Water Resources Institute (EWRI) Congress Conference, Miami FL, USA, May 22-26, 2016*.
9. **Kanel, S. R.**, Manning B., Zero-valent iron nanoparticles for soil, water and wastewater treatment: Present scenario, 251th ACS National Meeting, San Diego, CA, USA, March 22-26, **2016**.
10. **Kanel, S. R.**, Manning B., Brittle, S. W., Sizemore, I. P, Investigation of Silver Nanoparticle Interaction with Manganese Dioxide Using X-ray Spectroscopic and Microscopic Techniques, 251th ACS National Meeting, San Diego, CA, USA, March 22-26, **2016**.
11. Brittle, S. W., Dagher J., **Kanel, S. R.**, Meyerhoefer I.E., Sizemore, I. P, One-dimensional transport of colloidal silver nanoparticles in a saturated porous media: A laboratory experiment for chemistry and engineering students., 251th ACS National Meeting, San Diego, CA, USA, March 22-26, **2016**.
12. Manning B., **Kanel, S. R.**, Imaging and Spectroscopic Studies of Inorganic Contaminant-Treated Nanoscale Zerovalent Particles, 251th ACS National Meeting, San Diego, CA, USA, March 22-26, **2016**.
13. Rashid, U., **Kanel, S. R.**, Bezbaruah, A. Injectable Nanoparticle-based Permeable Reactive Barriers for Groundwater Contaminant Remediation, *Environmental & Water Resources Institute (EWRI) Congress Conference, Austin TX, USA, May 17-21, 2015*.

14. **Kanel, S. R.**, M. Kempisty, D., Goltz, M.N. Application of Carbon Nanotubes as a Filter Media to Treat Nitroaromatic-contaminated Water, *Environmental & Water Resources Institute (EWRI) Congress Conference, Austin TX, USA, May 17-21, 2015.*
15. Emily N. A., **Kanel, S. R.**, Brittle, S. W., Markopoulos, M. M. Sizemore, I. P., Kempisty, D., Goltz, M.N. Application of Carbon Nanotubes as a Filter Media to Treat Nitroaromatic-contaminated Water, *Wright State University Celebration of Research, Dayton April 10, 2015.*
16. **Kanel, S. R.**, Doane, B., Misak H., Mall, S., Brittle, S. W., Sizemore, I. P., Ebrahimian, T., Kempisty, D., Goltz, M. Kempisty, D., Goltz, M.N. Application of Carbon Nanotube Yarn as a Filter Media to Treat Nitroaromatic-contaminated Water, *245th ACS National Meeting, Denver, Co, USA, March 22-26, 2015.*
17. O'Neil K., Jessica Fraley, J., Brittle, S., Purvis, J., **Kanel S. R.**, Higgins, S., Sizemore, I. P. Raman study of the adsorption behavior of silver nanoparticles at mineral- and natural organic matter-water interfaces, *245th ACS National Meeting, Denver, Co, USA, March 22-26, 2015.*
18. **Kanel, S. R.**, Bruce A. Manning, B.A. Brittle, S. W., Sizemore, I.E.P., Felker, D., Kempisty, D., Goltz, M.N. Spectroscopic and microscopic investigation of soil mineral and natural organic matter-treated silver nanoparticles, *245th ACS National Meeting, Denver, Co, USA, March 22-26, 2015.*
19. **Kanel, S. R.**, Mario, T., Meyerhofer, A., Goltz, M. N. Photo-oxidation of Nitroaromatic Explosives in Aqueous Solution by Silver Doped Titanium Dioxide Thin Film in the Presence of Natural Solar Light, *World Environmental and Water Resource Congress, Portland, Oregon, USA, June 1-5, 2014.*
20. **Kanel, S. R.**, Mario, T., Goltz, M. N. The Challenges of Remediating Perfluorinated Compounds with Energy Efficient Techniques, *Ninth International Conference of Chlorinated and Recalcitrant Compounds Battelle Conference, Monterey, California · May 19-22, 2014*
21. **Kanel, S. R.**, Choi, H., Goltz, M. N. Transport of surface-modified iron nanoparticle in porous media and application to arsenic remediation, *World Environmental and Water Resource Congress, Cincinnati OH, USA, May 19-23, 2013.*
22. **Kanel, S. R.**, Malla, G., Choi, H. Stochastic modeling and study of the mechanism of mobilization of the arsenic contamination in the groundwater of Nepal in South Asia, *World Environmental and Water Resource Congress, Cincinnati OH, USA, May 19-23, 2013.*
23. **Kanel, S. R.**, Han, C., Meyerhofer, A., Crossond, G., Dionysiou, D.D., Agrawal, A, Pavel, I., Taylor, P.H., Striebich, R., Christopher A. Impellitteri, Goltz, M.N. Comparison of photo-degradation of 2,4-dinitrotoulene by silver doped and undoped titanium dioxide thin film in the presence of solar and uv light, *245th ACS National Meeting, New Orleans, LA, USA, April 7–11, 2013.*
24. **Kanel, S. R.**, Han, C., Meyerhofer, A., Crossond, G., Dionysiou, D.D., Agrawal, A, Pavel, I., Taylor, P.H., Striebich, R., Goltz, M.N. Photo-degradation of 2,4-dinitrotoulene by silver doped titanium dioxide thin film in the presence of natural solar light: kinetics and degradation pathways, *244th Sustainable Nanotechnology Organization, Arlington VA, USA, November 4-6, 2012.*

25. **Kanel, S. R.**, Flory J., Racz L., Goltz, M. N. Fate and transport of silver nanoparticles and silver ions in saturated porous media: laboratory experiments and modeling, *244th ACS National Meeting, Philadelphia, PA, USA, August 19-23, 2012*.
26. **Kanel, S. R.** Fate and transport of nanoparticles and their applications for soil, water, and wastewater treatment, *244th ACS National Meeting, Philadelphia, PA, USA, August 19-23, 2012*.
27. Stevens T. J., **Kanel, S. R.**, Kim, D. S. Goltz, MN. Stabilizing acetylcholinesterase on carbon electrodes to produce effective biosensors, *244th ACS National Meeting, Philadelphia, PA, USA, August 19-23, 2012*.
28. Dagher J. M., **Kanel S. R.**, Meyerhoefer A., Goltz M. N., and Pavel Sizemore I. Transport of engineered silver nanoparticles through saturated porous media, *Wright State University, Dayton, OH, USA, June 1, 2012*.
29. Flory, J.R., **Kanel, S.R.**, Racz, L., Impellitteri, C.A., Silva, R.G., and Goltz, M.N. Influence of pH on the Transport of Silver Nanoparticles in Saturated Porous Media: Lab Experiments and Modeling, *86th ACS Colloid & Surface Science Symposium, Johns Hopkins University, MD, USA, 11-13 June 2012*.
30. **Kanel, S. R.**, Flory J., Racz L., Goltz, M. N. Road towards sustainability: understanding silver nanoparticle and silver ion transport in saturated porous media, *World Environmental and Water Resource Congress, Albuquerque NM, USA, May 20-24, 2012*.
31. Dagher J. M., **Kanel S. R.**, Meyerhoefer A., Goltz M. N., and Pavel Sizemore I. E.; Transport of engineered silver nanoparticles through saturated porous media, Celebration of Research, Wright State University, Dayton, OH, USA, April 13, **2012**.
32. Meyerhoefer A., Dagher J. M., **Kanel S. R.**, Goltz M. N., and Pavel Sizemore I. E. A study of the transport of different size silver nanoparticles in saturated porous media, Celebration of Research, Wright State University, Dayton, OH, USA, April 13, **2012**.
33. Dagher J. M., Meyerhoefer A., **Kanel S. R.**, Goltz M. N., and Pavel Sizemore I. E. A study of the transport of different size silver nanoparticles in saturated porous media, *ACS Local Section Meeting, Central State University, Xenia, OH, USA, April 03, 2012*.
34. **Kanel, S. R.**, Flory J., Racz L., Impeliteri C. A., Nadagouda , M. Silva R. G., Huang J., Goltz, M. N. Fate and transport of silver nanoparticles and related products in saturated porous media, *243 rd ACS National Meeting and Exposition, San Diego CA, USA, March 25-29, 2012*.
35. McPherson A., Agrawal, A., Danner, K., Goltz M. N., and **Kanel, S. R.**, Degradation of carbon tetrachloride by stabilized bimetallic palladium-zero-valent iron (Pd-nZVI) nanoparticles, *243 rd ACS National Meeting and Exposition, San Diego CA, USA, March 25-29, 2012*.
36. Swarnakar P., **Kanel, S. R.**, Jiang Y., Kerr L., Goltz M. N., Levy, J., Rakovan, J. Visible light activity of silver coated titanium dioxide thin film for photocatalysis of organic compounds using natural solar light. *243 rd ACS National Meeting and Exposition, San Diego CA, USA, March 25-29, 2012*.
37. Flory, J., **Kanel, S. R.**, Racz, L., Impellitteri, C. A. and Goltz, M. N. Influence of pH on the transport of silver nanoparticles in saturated porous media, *USAF ASC/AFRL Engineered Nanomaterials Environment, Safety, & Health Workshop, Fairborn, OH, USA, January 10-12, 2012*.
38. **Kanel, S. R.**, Danner, K., McPherson A., Goltz M. N., and Agrawal, A. Degradation of carbon tetrachloride by nickel-modified nanoscale zerovalent iron stabilized with CMC,

- 242nd ACS National Meeting and Exposition, Denver CO, USA, August 27-September 1, 2011.
39. McPherson A., **Kanel, S. R.**, Danner, K., Agrawal, A., and Goltz M. N. Degradation of carbon tetrachloride by stabilized bimetallic nanoscale zerovalent Iron, 242nd ACS National Meeting and Exposition, Denver CO, USA, August 27-September 1, 2011.
 40. **Kanel, S. R.** and Goltz M. N. Fate and transport of nanoscale silver particles in saturated porous media, *Gordon Research Conference*, Waterville Valley, NH, USA, May 29 - June 04, 2011.
 41. Vijwani, H., **Kanel, S. R.**, Mukhopadhyay, A., Agrawal, A., and Goltz M. N. Nanoscale hybrid structures for treatment of chlorinated organic compounds, *Ohio Innovation Summit*, Toledo OH, USA, April 19-20, 2011.
 42. **Kanel, S. R.**, Racz L., Huang J., and Goltz M. N. **Transport of engineered nanosilver particles** in saturated porous media, 241st ACS National Meeting and Exposition, Anaheim, CA, USA, March 27-31, 2011.
 43. **Kanel, S. R.**, Goltz M. N., and Agrawal A. Fate and transport of nano materials and their application for soil and groundwater remediation, *RemTEC*, Chicago, IL, USA, May 16-19, 2011.
 44. **Kanel, S. R.**, Choi, H., and Goltz M. N. Transport of iron nanoparticles and their application for arsenic, Strategic Environmental Research and Development Program (SERDP), *Partners in environmental technology technical symposium & workshop* Washington DC, USA, Nov 30-Dec-02, 2010.
 45. **Kanel, S. R.**, Costanza J., and Pennell K. D. Catalytic reduction of tetrachloroethene dense non-aqueous phase liquid by different types of reactive iron nano particles, 237th ACS National Meeting and Exposition, Salt Lake City, UT, USA, March 22-26, 2009.
 46. **Kanel, S. R.**, Barnett, M. O., and Clement, T. P. Synthesis of nano-hydroxyapatite and its application for uranium remediation, 237th ACS National Meeting and Exposition, Salt Lake City, UT, USA, March 22-26, 2009.
 47. Giasuddin, A. B. M., **Kanel, S. R.**, Locklin J., and Chittaranjan, R. Removal of methyl parathion from water by nanoscale zero-valent iron, 236th ACS National Meeting and Exposition, Philadelphia, PA, USA, August 17-21, 2008.
 48. **Kanel, S. R.**, Goswami, R., and Clement, T. P. Two dimensional transport characteristics of iron nanoparticles in porous media, *International Groundwater Monitoring Center, Colorado School of Mines*, Golden, CO, USA, May 19-21, 2008.
 49. **Kanel, S. R.**, Goswami, R., Clement, T. P. Barnett, M. O., and Zhao, D. Transport of surface stabilized zero-valent iron nano particles in two-dimensional flow container packed with porous media, 235th ACS National Meeting and Exposition, New Orleans, LA, USA, April 6-10, 2008.
 50. **Kanel, S. R.**, Barnett, M. O., and Clement, T. P. Removal of uranium from groundwater using different types of synthetic and natural hydroxyapatite material, 235th ACS National Meeting and Exposition, New Orleans, LA, USA, April 6-10, 2008.
 51. Hartzog, O. K., Jeppu, G., **Kanel, S. R.**, Loganathan, V. A., Barnett, M. O. and Clement, T. P. Scaling arsenate adsorption on goethite coated sand: laboratory experiments and surface complexation modeling, *Alabama Water Resources Conference*, Auburn, AL, USA, Sept. 6, 2007.
 52. **Kanel, S. R.**, Hartzog, O. K., Loganathan, V. A., Barnett, M. O., and Clement, T. P. Comparison of arsenic removal from groundwater by iron oxide coated sand:

- Mechanisms, Kinetics, and influence of anions, *233rd ACS National Meeting and Exposition*, Chicago, IL, USA, March 25-29, **2007**.
53. Loganathan, V., **Kanel, S. R.**, Clement, T. P., and Barnett, M. O. Adsorption of uranium to goethite coated sand: Effect of pH and solid-to-solution ratio, *233rd ACS National Meeting and Exposition*, Chicago, IL, USA, March 25-29, **2007**.
 54. Ryu, A., Han, S., **Kanel, S. R.**, and Choi, H. Catalytic destruction of trichloroethylene by noble surface modified bimetallic iron nanoparticles, *The 8th International Symposium on Eco-materials Processing and Design*, Fitakyushu, Japan, January 11–14, **2007**.
 55. Ryu, A., Han, S., **Kanel, S. R.**, and Choi, H. Catalytic reduction of trichloroethylene by a new surfactant-stabilized bimetallic nanoscale zerovalent iron from water, *232nd ACS National Meeting*, San Francisco, CA, USA, September 10–14, **2006**.
 56. **Kanel, S. R.** and Choi, H. Arsenic remediation from groundwater by environmentally reactive iron nano particles. As(2006) *International Congress*, Natural arsenic in groundwater of Latin America, Mexico City, Mexico, June 20-24, **2006**.
 57. Kannel, P. R., **Kanel, S. R.**, and Nepal, S. Arsenic crisis in Nepal: key issues and remediation. As(2006) *International Congress*, Natural arsenic in groundwater of Latin America, Mexico City, Mexico, June 20-24, **2006**.
 58. **Kanel, S. R.** and Choi, H. Nanotechnology for the environmental remediation: an application of iron nano particles for groundwater treatment. *3rd IUPAC-sponsored International Symposium on Macro- and Supramolecular Architectures and Materials (MAM-06): Practical Nano-Chemistry and Novel Approaches*. Tokyo, Japan, 28 May - 1 June, **2006**.
 59. **Kanel, S. R.** and Choi, H. Comparison of arsenic(III) and arsenic(V) removal by nano scale zero-valent iron from groundwater. *Korea Society of Environmental Engineers*, Ilsan, Korea, April 27-29, **2006**.
 60. Giasuddin, A. B. M., **Kanel, S. R.**, and Choi, H. Effect of natural organic matter on arsenite removal using nano scale zero valent iron. *Korea Society of Environmental Engineers*, Ilsan, Korea, April 27-29, **2006**.
 61. Choi, H., **Kanel, S. R.**, and Ryu, A. Reactive nano particles to environmental application: removal of arsenic and trichloroethylene. *The 89th International Symposium of KSABC organized by The Korean Society for Applied Biological Chemistry*, Chonam University, Gwangju, South Korea, April 21, **2006 (An Invited Special Lecture)**.
 62. **Kanel, S. R.** and Choi, H. Synthesis of polymer stabilized iron nano particle and their application in environmental remediation. *2005 International Conference on nanoscience and nanotechnology*, Gwangju, Korea, November 10-12, **2005**.
 63. **Kanel, S. R.** and Choi, H. The transport characteristics of polymer stabilized Nano Scale Zero-valent Iron in porous media. *The fifth IWA international symposium on wastewater reclamation and reuse for sustainability*, Jeju, South Korea, November 8-11, **2005**.
 64. **Kanel, S. R.** and Choi, H. Removal of arsenate from groundwater by nano scale zero-valent iron. *Korea Society of Environmental Engineers*, Seoul, Korea, November 3-5, **2005**. (Best Oral Presentation award from Korea Society of Environmental Engineers, South Korea).
 65. **Kanel, S. R.** and Choi, H. The Transport characteristics of surfactant stabilized iron nano particle in unsaturated porous media. *230th ACS National Meeting*, Washington DC, USA, August 28-September 1, **2005**.
 66. **Kanel, S. R.** and Choi, H. Application of surface modified iron nano particle in

- groundwater remediation. *Korea Society of Environmental Engineers*, Suwon, Korea, April 28-30, **2005**.
67. Manning B. A., Kiser J., **Kanel S. R.**, and Choi H. Removal of arsenic(III) from groundwater with nano scale zero-valent iron. *American Geophysical Union (AGU) meeting*, San Francisco, USA, Dec. 13-17, **2004**.
 68. **Kanel, S. R.** and Choi, H. Removal of arsenic from groundwater by nano scale zerovalent iron as a colloidal reactive barrier material. *International Symposium on Environmental Nanotechnology*, Taipei, Taiwan, Dec. 1 - 3, **2004**.
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PROFESSIONAL ACTIVITIES

1. *Adjunct Faculty in Nebraska Water Center, University of Nebraska, Lincoln, NE 68588-6204, USA; Adjunct Faculty in Wright State University, Dayton, OH 45435*
2. *Adjunct Faculty in Department of Chemistry, Wright State University, Oelman Hall 464, 3640 Colonel Glenn Hwy., Dayton, OH 45435-0001*
3. *Editorial in Chief of Environmental and Earth Sciences research Journal- International Information and Engineering Technology Association, www.iieta.org*
4. *Editorial Board Member of J of Solar Energy Research Updates, Avanti Publishers*
5. *Editor, Groundwater for Sustainable Development, Elsevier*
6. *International Symposium Chair Organizers, Presiding Chair, Topic: Applications & Implications of Nanomaterials & Their Toxic Effects, American Chemical Society, March 31 - April 4, 2019, Orlando, FL*
7. *Moderator and Program Chair at the World Environmental Water Resources Congress on June 3-7, 2018 Minneapolis, MN*

8. Moderator and Program Chair at the World Environmental Water Resources Congress on May 21-25, **2017** Sacramento, CA
9. Moderator and Program Chair at the World Environmental Water Resources Congress on May 22-26, **2016** West Palm Beach, FL
10. National Science Foundation (NSF)-*SBIR/STTR Proposal Review Panelist, 2016*
11. UEPA- *Small Business Innovation Research (SBIR) Proposal Review Panelist, 2016*
12. *Conference Organizer-* (The Organizing Committee-member) in a Symposium entitled “Advances in In Situ Pollutant Destruction by Nanoscale Zero Valent Iron & Other Engineered Nanoparticles” hosted by ACS Spring on march 16-17, **2016**, SanDiego CA
13. Moderator and Program Chair at the World Environmental Water Resources Congress on May 17-21, **2015** Austin, TX
14. Moderator and Program Chair at the World Environmental Water Resources Congress on June 1-5, **2014** Portland, OR
15. Moderator and Program Chair at the World Environmental Water Resources Congress on May 19-23-1-5, **2013** Cincinnati OH
16. Moderator and Program Chair at the World Environmental Water Resources Congress on May 20-24, **2012** Albuquerque NM
17. *Journal Reviewer-* Environmental Science and Technology, Journal of Physics and Chemistry of Solids, Journal of Nanoparticle Research, Water Research, Journal of Environmental Management, Geochimica et Cosmochimica Acta, Journal of Environmental Engineering, Chemosphere, Journal of Hazardous Materials, ACS Sustainable Chemistry & Engineering, Royal Society of Chemistry, Environmental Technology, the Journal of Visualized Experiments.
18. *Conference Organizer-* (The Organizing Committee-member) in a Symposium entitled “Nanotechnology for Environmental Cleanup and Pollution Control – Science, Implementation, and Regulatory Issues” hosted by The Groundwater Resources Association of California symposium on November 3, **2009**, Burlingame, CA
19. *Project Reviewer* Panelist for NSF, United State Department of Agriculture (USDA), Natural Sciences and Engineering Research Council and Canada (NSERC)
20. *Societal Activities* EWRI (ASCE) Groundwater Quality-Secretary, Active participant of ACS meetings Natural Sciences and Engineering Research Council of Canada (NSERC)

PROFESSIONAL AFFILIATIONS

Sigma XI (Full member), American Chemical Society, American Geophysical Union, The Soil Science Society of America, American Civil Engineering Society, American Water Works Association, Engineers Club of Dayton

REFERENCES

Available upon request