

Personal Details

Bangwooh Han, Ph. D.

Born on 18 November, 1974, Married

Postdoctoral research associate

Department of Civil and Environmental Engineering

University of Southern California (USC)

3620 S. Vermont Ave., Los Angeles, CA 90089

Tel: +1-213-740-0999

FAX: +1-213-821-1107

E-mail: bangwooh@usc.edu



Research Experiences

Skills and Qualification

- Exclusive experience in research especially for the measurement and characterization of nanoparticles via SMPS, DMA, CPC, FCE, APS, ELPI, SEM/TEM, XRD, EDS, FT-IR etc. and soluble organic fractions using FID, GC-MS etc.
- Practical experience in nanoparticle synthesis using flame, furnace reactor and electro spray etc.
- Practical experience in the charging of aerosol nanoparticles using radioactive materials, corona discharging, soft X-ray and electro spray etc.
- Practical experience in particle sampling using electrostatic and thermophoretic forces
- Extensive background in FORTRAN, LABVIEW

Recent Works

- Particle charging of ultra-fine aerosol particles without generating ozone
- Enhancement of particle charging via versatile aerosol concentration enrichment system (VACES)
- Electrostatic sampling of atmospheric aerosols after VACES

Education

1999.03-2003.08 D.S. Mechanical and Aerospace Engineering,
Seoul National Univ.
(Supervisor: Prof. Mansoo Choi)

- (Thesis title: Studies on the charging of aerosol nanoparticles using soft X-ray photoionization and electrospray ionization)
- 1997.03-1999.02 M.S. Mechanical and Aerospace Engineering, Seoul National Univ.
(Supervisor: Prof. Mansoo Choi)
(Thesis title: Measurement of Particle Size Distribution using a Sampling Technique in a Coflow Flame)
- 1993.03-1997.02 B.S. Mechanical Engineering, Seoul National Univ.

Carrier

- 2001.09-2002.11 Guest Researcher at Hiroshima University
(Worked with Prof. Kikuo Okuyama)
- 2003.09-present Senior Researcher at Korea Institute of Machinery and Materials (KIMM), Korea
- 2007.12-present Postdoctoral research associate at University of Southern California (USC)

Research Interests

Particle sampling, Particle charging, Particle measurements, Electrospray, Spray pyrolysis, Indoor Air filtration, Bioaerosols etc.

International Papers

1. M. Shimada, **B. Han**, K. Okuyama and Y. Otani, 2002, "Bipolar Charging of Aerosol Nanoparticles by a Soft X-ray Photoionizer", *Journal of Chemical Engineering of Japan*, Vol. 35, pp. 786-793.
2. **B. Han**, M. Shimada, M. Choi and K. Okuyama, 2003, "Unipolar Charging of Nanosized Aerosol Particles Using Soft X-ray Photoionization", *Aerosol Science and Technology*, Vol. 37, pp. 330-341.
3. **B. Han**, M. Shimada, K. Okuyama and M. Choi, 2003, "Classification of Monodisperse Aerosol Particles Using an Adjustable Soft X-ray Charger", *Powder Technology*, Vol. 135-136, pp 336-344.
4. K. Nakaso, **B. Han**, K.H. Ahn, M. Choi and K. Okuyama, 2003, "Synthesis of Non-agglomerated Nanoparticles by an Electrospray Assisted Chemical Vapor Deposition (ES-CVD) Method", *Journal of Aerosol Science*, Vol. 34, pp.

869-881.

5. **B. Han**, I. W. Lenggoro, M. Choi, and K. Okuyama, 2003, "Measurement of Cluster Ions and Determination of Residues in Waters by Electrospray/Differential Mobility Analyzer", *Analytical Sciences*, Vol. 19, 843-851.
6. M. Kang, H. Kim, **B. Han**, J. Suh, J. Park and M. Choi, 2004, "Nanoparticle pattern deposition from gas phase onto charged flat surface", *Microelectronic Engineering*, Vol. 71, 229-236.
7. J. Suh, **B. Han**, D.S. Kim, M. Choi, 2005, "A Method for Enhanced Charging of Nanoparticles via Condensation Magnification", *Journal of Aerosol Science*, Vol. 36, 1183-1193.
8. J. Suh, **B. Han**, K. Okuyama, M. Choi, 2005, "Highly Charging of Nanoparticle Through Electrospray of Nanoparticle Suspension", *Journal of Colloid Interface Science*, Vol. 287, 135-140.
9. H. Kim, J. Kim, H. Yang, J. Suh, T. Kim, **B. Han**, S. Kim, D. S. Kim, P. V. Pikhitsa, M. Choi, 2006, "Parallel Patterning of Nanoparticles via Electrodynamic Focusing of Charged Aerosols", *Nature Nanotechnology*, Vol. 1, 117-121. (Nature Pub. Group)
10. Y. J. Kim, **B. Han**, H. Chang, H. D. Jang, 2006, "Research Status on Powder Technology with Environment in Korea", *Powder Science & Engineering*, Vol. 38(7), 41-47. (in Japanese)
11. **B. Han**, H. J. Kim, Y. J. Kim, C. Sioutas, 2008, "Unipolar Charging of Ultra-fine Aerosol Particles using Carbon Fiber Ionizers", *Aerosol Science and Technology*, Submitted.

International Proceedings

1. C. H. Jung, **B. Han**, K. H. Ahn, M. Choi and J. S. Lee, 1999, "Measurement of Particle Size Distribution during Flame Synthesis Using in Situ Sampling Probe", *Journal of Aerosol Science*, Vol. 30, supplement 1, pp.S351-S352, European Aerosol Conference, Sep. 6-10, 1999, Praha, Czech.
2. C. H. Jung, M. Choi, **B. Han**, J. S. Lee, S. H. Sohn and K. H. Ahn, 1999, "Particle Size Distribution and Morphology during Flame Synthesis: In situ Sampling Probe Measurement", *The 1st Asian Aerosol Conference*, pp.217-218, July. 27-29, 1999, Nagoya, Japan.
3. M. Shimada, **B. Han**, K. Okuyama and Y. Otani, 2002, "Charging of Aerosol Nanoparticles by a soft X-ray photoionizer", *The 19th Symposium on Aerosol*

- Science and Technology, Aug. 6-8, 2002, Kyoto, Japan.
4. **B. Han**, I. W. Lenggoro, M. Choi and K. Okuyama, 2002, "Mobility Analysis of Cluster Ions and Residue Nanoparticles Generated in Electrospray of Water", 6th International Aerosol Conference, Sep. 8-13, 2002, Taipei, Taiwan.
 5. M. Shimada, **B. Han**, K. Okuyama and Y. Otani, 2002, "Charging of Nanosized Aerosol Particles by Soft X-ray Photoionization", 6th International Aerosol Conference, Sep. 8-13, 2002, Taipei, Taiwan.
 6. W. Lenggoro, K. Okuyama, **B. Han** and M. Choi, 2003, "Measurement of cluster ions and residues in water samples via an elctrospray route", The 20th Symposium on Aerosol Science and Technology, July. 29-31, 2003, Tsukuba, Japan.
 7. **B. Han**, M. Shimada, K. Okuyama and M. Choi, 2004, "Generation of Singly Charged Aerosol Particles Using a Power Adjustable Soft X-ray Charger", The 3rd Asian Aerosol Conference, Jan. 6-9, 2004, Hong Kong.
 8. **B. Han**, S. C. Hwang and Y. J. Kim, 2004, "Charging and Diffusion Collection of Aerosol Nanoparticles less than 20 nm in Electrostatic Precipitator", European Aerosol Conference, Sep. 6-10, 2004, Budapest, Hungary.
 9. Y. J. Kim, **B. Han** and S. C. Hwang, 2004, "Removal of Aerosol Pollutants via an Electrostatic Coagulation Technique", AAAR Conference, Oct. 4-8, 2004, Atlanta, Georgia.
 10. Jeongsoo Suh, **Bangwoo Han**, Dae Sung Kim, Kikuo Okuyama, "Novel Charging Methods for Nanoparticles", 6th KSME-JSME Thermal and Fluids Engineering Conference, Mar. 20-23, 2005, Jeju, Korea.
 11. J. Suh, **B. Han**, D.S. Kim and M. Choi, "A Method for Enhanced Charging of Nanoparticles via Condensation Magnification", European Aerosol Conference, Aug. 28 - Sep. 2, 2005, Ghent, Belgium.
 12. Jeongsoo Suh, **Bangwoo Han**, Kikuo Okuyama, and Mansoo Choi, "Highly Charging of Nanoparticles through Electrospray of Nanoparticles Suspension", AAAR Conference, Oct. 17-21, 2005, Austin, Texas.
 13. Jeongsoo Suh, **Bangwoo Han**, Dae Seong Kim, Kikuo Okuyama and Mansoo Choi, "Novel Methods for Generating Highly Charged Nanoparticles", The 4th Asian Aerosol Conference, Dec. 13-16, 2005, Mumbai, India.
 14. **Bangwoo Han**, Soon-Chul Hwang, Yong-Jin Kim, Manabu Shimada and Kikuo Okuyama, "Charging and Collection Characteristics of Aerosol

- Nanoparticles Less Than 20 nm in an Electrostatic Precipitator”, The 4th Asian Aerosol Conference, Dec. 13-16, 2005, Mumbai, India.
15. Soonchul Hwang, **Bangwoo Han**, Sung-Han Yun, Yong-Jin Kim, “Size Distribution of Particulate Matters from a Common Rail Diesel Engine with the Diesel Particulate Filter”, The 4th Asian Aerosol Conference, Dec. 13-16, 2005, Mumbai, India.
 16. H. Kim, J. Kim, H. Yang, J. Suh, T. Kim, **B. Han**, S. Kim, D. S. Kim, P. V. Pikhitsa, M. Choi, “Focused Parallel Patterning of Charged Aerosols”, 7th International Aerosol Conference, Sep. 10-15, 2006, St. Paul, Minnesota
 17. H. J. Kim, **B. Han**, Y. B. Kim, Y. J. Kim, “Ozone Effect on Artificial Exhaust Particles”, The 5th Asian Aerosol Conference, Aug. 26-29, 2007, Kaohsiung, Taiwan.
 18. Y. J. Kim, **B. Han**, D. K. Song, H. J. Kim, “Experimental and Theoretical Studies on High Temperature Electrostatic Precipitation of Submicron Particles”, The 18th International Symposium on Transport Phenomena, Aug. 27-30, 2007, Daejeon, Korea
 19. H. J. Kim, **B. Han**, Y. J. Kim, “Removal of Volatile Organic Compounds using a Plasma Assisted Biofiltration System”, The 18th International Symposium on Transport Phenomena, Aug. 27-30, 2007, Daejeon, Korea
 20. **B. Han**, H. J. Kim, Y. J. Kim, “In-situ Analysis of Diesel Nano PM, THC and SOF using Multi DMAs-CPCs and FID in Transient Engine Conditions”, European Aerosol Conference, Sep. 9-14, 2007, Salzburg, Austria.

Patents

1. Kikuo Okuyama, Manabu Simada, Mansoo Choi, **Bangwoo Han**, Aerosol Particle Classification Apparatus, US Pub. No. 20050180543A1 (Aug. 18, 2005)
2. **Bangwoo Han**, Jeongsoo Suh, Mansoo Choi, Method for patterning nano-sized structure, US Pub. No. 20060093750A1 (May 04, 2006)