

Bumjung Kim

2039 John F. Kennedy blvd, S-550G, Jersey City, NJ 07305
Office: 201-200-3581, E-mail: bkim1@njcu.edu

Education

- 2006-2011* **Columbia University, New York**
Ph.D in Chemistry/Materials Science
Dissertation Title: Single-crystal growth of organic semiconductors and organic electronic applications
Dissertation Advisor: Prof. Colin Nuckolls
- 2002-2006* **Hanyang University, Seoul, South Korea**
B.S in Chemistry

Professional Experience

- 2013-present* **New Jersey City University, Jersey City**
Assistant Professor, Inorganic Chemistry
Research Interest: Fabrication and structural analysis of organic electronic devices using organic semiconductor crystals such as graphene, carbon nanotubes, etc.
- 2011-2013* **IBM TJ Watson Research Center, Yorktown Heights**
/Energy Frontier Research Center (EFRC) of Columbia University, New York
Postdoctoral Researcher
Research Topic: Single carbon nanotube transistor as a DNA sensor
Principle Investigators: Dr. James Hannon, Prof. Colin Nuckolls, and Prof. James Hone
- 2004-2006* **Hanyang University, Seoul, South Korea**
Undergraduate Research Assistant
Research Topic: Synthesis and characterization of Imogolite, natural inorganic nanotube compound
Research Avdisor: Prof. Daewon Sohn

Teaching Experience

- 2013-present* **Assistant Professor, New Jersey City University, Jersey City**
- | | |
|---|------------------------------|
| Inorganic Chemistry | CHEM 416 |
| Physical Chemistry I/II and Laboratory | CHEM 305, 306, 3306 |
| General Chemistry I/II and Laboratory | CHEM 105, 106,
1105, 1106 |
| Preparation for General Chemistry | CHEM 100 |
| Principles of Chemistry (Online course) | CHEM 117 |
| Chemistry of Everyday Things (General Education course) | CHEM 130 |
- 2006-2007* **Teaching Assistant, Columbia University, New York**
General Chemistry Laboratory: Prof. Luis Avila
Organic Chemistry Laboratory: Prof. Luis Avila
Organic Chemistry: Prof. Colin Nuckolls

List of Publications

- 1) Hiszpanski, A. M.; Woll, A. R.; **Kim, B.**; Nuckolls, C.; Loo, Y. -L., Altering Polymorphic Accessibility of Polycyclic Aromatic Hydrocarbons with Fluorine Substitution, *Chemistry of Materials*, **2017**, *29*(10), 4311-4316.
- 2) **Kim, B.**¹; Chiu, C. -Y.¹; Kang, S.; Kim, K. S.; Lee, G. -H.; Chen, Z.; Ahn, S.; Yager, K. G.; Ciston, J.; Nuckolls, C.; Schiros, T., Vertically grown nanowire crystals of dibenzotetrathienocoronene (DBTTC) on large-area graphene, *RSC Advances*, **2016**, *6*, 59582-59589.
¹ These authors are equally contributed to this work.
- 3) Hiszpanski, A. M.; Baur, R. M.; **Kim, B.**; Tremblay, N. J.; Nuckolls, C.; Woll, A. R.; Loo, Y. -L., Tuning polymorphism and orientation in organic semiconductor thin films via post-deposition processing, *Journal of American Chemical Society*, **2014**, *136*(44), 15749-15756.
- 4) **Kim, B.**; Franklin A. D.; Nuckolls, C.; Heansch, W.; Tulevski, G. S., Achieving low-voltage thin-film transistors using carbon nanotubes. *Applied Physics Letters*, **2014**, *105*, 06311.
- 5) Lee, C.-H.; Schiros, T.; Santos, E.J.G.; **Kim, B.**; Yager, K.G.; Kang, S.J.; Lee, S.; Yu, J.; Watanabe, K.; Taniguchi, T.; Hone, J.; Kaxiras, E.; Nuckolls, C.; Kim, P., Epitaxial Growth of Molecular Crystals on van der Waals Substrates for High-Performance Organic Electronics. *Advanced Materials*, **2014**, *26*(18), 2812-2817.
- 6) Kang, S.¹; Lee, G. -H.¹; Yu, Y. -J.¹; Zhao, Y.; **Kim, B.**; Watanabe, K.; Taniguchi, T.; Hone, J.; Kim, P.; Nuckolls, C., Organic field effect transistors based on graphene and hexagonal boron nitride heterostructures. *Advanced Functional Materials*, **2014**, *24*(32), 5157-5163.
¹ These authors are equally contributed to this work.
- 7) Zhang, X.; Chenet, D.; **Kim, B.**; Yu, J.; Tang, J.; Nuckolls, C.; Hone J., Fabrication of hundreds of field effect transistors on a single carbon nanotube for basic studies and molecular devices. *Journal of Vacuum Science & Technology B, Nanotechnology and Microelectronics: Materials, Processing, Measurement, and Phenomena*, **2013**, *31*(6), 06F101.
- 8) Kang, S.¹; **Kim, B.**¹; Kim, K. S.; Zhao, Y.; Chen, Z.; Kim, P.; Nuckolls, C., Inking elastomeric stamps with micro-patterned, single layer graphene. *Advanced Materials* **2011**, *23*, 3531-3535.
¹ These authors are equally contributed to this work.
- 9) Jung, N.; **Kim, B.**; Crowther, A. C.; Nuckolls C.; Brus, L., Optical reflectivity and raman scattering in few layer thick graphenes highly doped by K and Rb. *ACS nano* **2011**, *5*(7), 5708-5716.
- 10) Chiu, C. -Y.; **Kim, B.**; Gorodetsky, A. A.; Sattler, W.; Wei, S.; Sattler, A.; Steigerwald, M. L.; Nuckolls, C., Shape-shifting in contorted dibenzotetrathienocoronene. *Chemical Science* **2011**, *2*, 1480.
- 11) Itoh, Y.; **Kim, B.**; Gearba, R. I.; Tremblay N. J.; Pindak, R.; Matsuo, Y.; Nakamura, E.; Nuckolls, C., Simple formation of C₆₀ and C₆₀-ferrocene conjugated monolayers anchored onto silicon oxide with five carboxylic acids and their transistor applications. *Chemistry of Materials* **2011**, *23*, 970-975.
- 12) Chiu, C. -Y.; Schiros, T.; Yager, K.; Palma, M.; **Kim, B.**; Nuckolls, C., Heat-enhanced self-assembly of contorted dibenzotetrachalcogencoronenes. *Chemistry of Materials* **2011**, *2*, 1480-1486.
- 13) Cox, M.; Gorodetsky, A. A.; **Kim, B.**; Kim, K. S.; Jia, Z.; Kim, P.; Nuckolls, C.; Kymissis, I., Single-layer graphene cathodes for organic photovoltaics. *Appl. Phys. Lett.* **2011**, *98*, 123303.
- 14) Tremblay, N. J.; Gorodetsky, A. A.; Cox, M. P.; Schiros, T.; **Kim, B.**; Steiner, R.; Bullard, Z.; Sattler, A.; So, W. -Y.; Itoh, Y.; Toney, M. F.; Ogasawara, H.; Ramirez, A. P.; Kymissis, I.; Steigerwald, M. L.; Nuckolls, C., Photovoltaic universal joints: ball-and-socket interfaces in molecular photovoltaic cells. *ChemPhysChem* **2010**, *11*(4), 799-803.
- 15) Loo, Y. -L.; Hiszpanski, A.; **Kim, B.**; Wei, S.; Chiu, C. -Y.; Steigerwald, M. L.; Nuckolls, C., Unusual molecular conformations in fluorinated, contorted hexabenzocoronenes. *Organic Letters* **2010**, *12*(21), 4840-4843.
- 16) Maliakal, A. J.; Chem, J. Y. -C.; So, W. -Y.; Jockush, S.; **Kim, B.**; Francesca, O.; Maria, F.; Modelli, A.; Turro, N. J.; Nuckolls, C.; Ramirez, A. P., Mechanism for oxygen-enhanced photoconductivity in rubrene: electron transfer doping. *Chemistry of Materials* **2009**, *21*(22), 5519-5526.

- 17) Park, S.; Lee, Y.; **Kim, B.**; Lee, J.; Jeong, Y.; Noh, Takahara, A.; Sohn, D., Two-dimensional alignment of imogolite on a solid surface. *Chemical Communications* **2007**, 28, 2917.
- 18) Lee, Y.; **Kim, B.**; Yi, W.; Takahara, A.; Sohn, D., Conducting properties of polypyrrole coated imogolite. *Bull. Korean Chem. Soc.* **2006**, 27(11), 1815.

Presentations

- 1) **Kim, B.**, Fabrication of Rubrene Single-Crystal Field-Effect Transistor Using Hexatriacontane as Dielectric Layer, **2016 June**, presented at ACS Middle Atlantic Regional Meeting, "Organic electronics" session, Riverdale, NY
- 2) **Kim, B.**, Vertically Grown Nanowire Crystals of Dibenzotetrathienocoronene (DBTTC) on Large-area Graphene, **2016 August**, presented at 252nd ACS National Meeting, "Division of Colloidal and Surface Chemistry" session, Philadelphia, PA

Patent Inventions

Schroeder, J.; Nuckolls, C.; Cammisa, F. P.; Abjornson, C.; **Kim, B.**, Carbon nanotubes and graphene patches and implants for biological tissue, **2014**, WO# 2014143925 A1, New York, NY

Grants and Funding

Separately Budgeted Research Funding
Granted in 2013, 2014, 2015, 2016, 2017 and 2018

New Jersey City University (NJCU)

Professional Experience

Organic Electronics Session Host, **2016 June**, ACS Middle Atlantic Regional Meeting Conference, Riverdale, NY

Current Membership in Professional Organizations

2011-present Regular Member of American Chemical Society (ACS)
2017-present Regular Member of Materials Research Society (MRS)
2007-present Regular Member of Korean Scientists and Engineers Association (KSEA)

Computer/Technical Skills

- Extensive experience in building up and using vapor deposition systems; nanotube chemical vapor deposition (CVD), graphene CVD, and crystal growing physical vapor deposition (PVD) system.
- Design and fabrication of organic field-effect transistors (OFET) and organic photovoltaic cells (OPVC).
- Extensive experience in microscopic analysis – AFM and SEM.
- Extensive experience in clean room apparatus - thermal evaporator, e-beam evaporator, sputter coater, laser writer, spin-coater, reactive ion etching system, and UV ozone system.
- Microsoft office: Excel, Word, PowerPoint; Data analysis: Origin, Igor; Design: Adobe Photoshop

Languages

English (fluent), Korean (native language)