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EDUCATION

- 1991.4.-1995.9. Ph.D. in Inorganic and Physical Chemistry, Osaka University, Japan
 1988.3.-1990.2. M.A.Sc. in Applied Chemistry, Pukyong Nat'l University, South Korea
 1983.3.-1987.2. B.A.Sc. in Applied Chemistry, Pukyong Nat'l University, South Korea

EMPLOYMENT

- 2018 - **CEO/President**, Mara Nanotech Korea, inc., Daejeon, South Korea
 2016 - **CEO/President**, Mara Nanotech New York, inc., New York, NY, US
 2018 - **Adjunct Professor**, *College of Human Ecology*, Chungnam Nat'l University, South Korea
 2016 - **Visiting Scholar**, *Department of Pharmaceutical Sciences, Bouve College of Health Sciences*, Northeastern University, Boston, MA, US
 2014 - 2018 **Adjunct Associate Professor**, *Department of Nano-integrated Cogno-Mechatronics Engineering*, Pusan Nat'l University, Busan, South Korea
 2015 - 2016 **Director of Nanotechnology**, Detroit R&D, Inc., Detroit, MI
 2014, 2015 **Invited Professor**, *Institute of Nanotechnology, Ecole Centrale*, University of Lyon, Lyon, France
 2011 - 2015 **Associate Research Professor**, *Department of Mechanical and Industrial Engineering*, Northeastern University, Boston, MA, USA
 2019-2014 **Invited Professor**, *School of Physics*, Konkuk University, South Korea
 2003 - 2006 **Consultant for HealthCare Device**, Matsushita Electric Industrial Co. Ltd. (Panasonic), Japan
 2007 - 2011 **Designated Professor**, *The Institute of Scientific and Industrial Research*, Osaka University, Osaka, Japan
 2004 - 2007 **Designated Associate Professor**, *The Institute of Scientific and Industrial Research*, Osaka University, Osaka, Japan
 2003 - 2004 **Assistant Professor**, *The Institute of Scientific and Industrial Research*, Osaka University, Osaka, Japan
 2000 - 2003 **JSPS & Research Fellow**, *The Institute of Scientific and Industrial Research*, Osaka University, Osaka, Japan
 1996 - 2000 **Lecturer & Korea Research Foundation Fellow**, *Department of Chemistry*, Pukyong Nat'l University, Busan, South Korea
 1990 - 1991 **Lecturer**, *Department of Chemical Engineering*, Donggi college, Busan, South Korea

AWARDS AND HONORS

- 2018.12. Commendation by Ministry of Trade, Industry and Energy, Seoul, South Korea
- 2018.11. Women Enterprise Supporting Center Award, Seoul, South Korea
- 2008 Japan Securities Scholarship Foundation Award, Tokyo, Japan
- 2005 Research Fellowship, ATEC Co., Ltd. Japan
- 2001 Japan Society for the Promotion of Science (JSPS) Fellowship, Tokyo, Japan
- 1997 Young Scientist Fellow Award, Korea Research Foundation (KRF), South Korea
- 1998 Young Scientist Award, Korea Science and Engineering Foundation (KOSEF), South Korea
- 1988 Research Fellowship, Pukyong Nat'l University, South Korea
- 1983 -1987 Graduate Scholarship, Pukyong Nat'l University, South Korea

OTHER PROFESSIONAL RECOGNITIONS

- 2002, 11/02 Japanese Nikkei Industrial Newspaper, *“Development of Rapid Electrical DNA Chip”*
- 2004, 03/02 Japanese Mainichi Economical Newspaper, *“Development of Nanowell Array Electrode based DNA Chip toward Personalized Medicine”*
- 2004, 03/03 Japanese Mainichi Economical Newspaper, *“The 1st Nanotechnology: A Master Craftsman of Japan”*

PATENTS

1. **H.Y.Lee, “Manufacturing Methods of Biosensor Device”, PCT/US 19/23633 (2019.3.22) _ by Mara Nanotech New York and South Korea, INC.**
2. **H.Y.Lee, “Manufacturing Methods of Biosensor Device”, US Pub. No : US_2017-0219554-A1 (2018.3.23) _ Assignment in Mara Nanotech New York, INC.**
3. **H.Y.Lee, “Manufacturing Methods of Biosensor ”, Korea Pub. No.: 10-2018-0033974 (2018.3.23) by Mara Nanotech Korea, inc.**
4. **H.Y.Lee, “Nanomediical Sensor using Nanowell Array Technology”, U.S. Patent Application, Pub. No.: 62288439 (Jan. 29, 2016) by Mara Nanotech New York, inc.**
5. **H.Y.Lee, “Protein chip and Biosensor using Nanowell Array Electrode”, Japanese Patent: #4497903 (2010.4.23) _ Assignment in Mara Nanotech New York, inc.**
6. **H.Y.Lee, B.H.Park, J.K.Lee, A.Y.Kim, I.R.Whang, “Nanobiochip using insulator of metal”, Korean Patent Application Number: 2009-0083024 (2011.8.19.).**
7. **B. K. Lee, H.Y.Lee, T. Kawai, N. Y. Hong, D. P. Kim, “Highly durable replica mold for nanoimprint lithography and a method of manufacturing the same”, Japanese Patent Application H.Y.Lee Number: 2009-136157 (2009.6.5.).**
8. **D. P. Kim, N. Y. Hong, B. K. Lee, H.Y.Lee, T. Kawai, “The manufacture method of high durable replica mold for nanolithography”, Japanese Patent Application Number: 2009-0006902 (2009.1.29.).**
9. **B. K. Lee, H.Y.Lee, T. Kawai, N. Y. Hong, D. P. Kim, “Fabrication method of replica mold with high mechanical properties for Nanoimprint lithography” Japanese Patent Application Number: 2008-239827**

(2008.9.18.).

10. H. J. Choa, J. H. Seo, B. K. Lee, K. Adachi, **H.Y.Lee**, T. Kawai, “*Direct immobilization method of carbohydrates on surface of solid substrate*” Korea Patent Application Number: 2006-0105908 (2006.11.20.).
11. **H.Y.Lee**, B. K. Lee, K. Adachi, T. Kawai, S. Matsuura, H. J. Choa, J. H. Seo, “*Development of direct immobilization of polysaccharides on surface for various application of carbohydrate*”, Japanese Patent Application Number: 2006-288952 (2006.11.29.).
12. **H.Y.Lee**, B. K. Lee, T. Kawai, “*Biochip and amyloid sensor by β -amyloid oligomer and assay method of β -amyloid in cell*”, Japanese Patent Application Number: 2006-206822 (2006.7.28.).
13. **H.Y.Lee**, T.Kawai, H.S.Jung, J.W.Park, T.Yukimasa, H.Oka, “*Microarray chip and immobilization method of Liposome*”, Japanese Patent Application Number: 2004-346720 (2004.11.30.).
14. T. Kawai, H. Tanaka, Y. G. Park, **H.Y.Lee**, and T. Kanki, “*Nonvolatile Photomemory by Organic/Inorganic Heterostructure*”, Japanese Patent: #3972096 (2003.1.12).

JOURNAL ARTICLES (peer reviewed)

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1. “Measuring Bone Biomarker Alkaline Phosphatase with Wafer-Scale Nanowell Array Electrodes” J.K.Lee, C. Bubar, H.G.Moon, J.Kim, A.Busnaina, **H.Y.Lee***, S. Shefelbine*, *ACS Sensors*, 3 (12), 2709–2715 (2018)
2. “Innovations in Biomedical Nanoengineering for Healthier Life: Nanowell Array technology based Biosensor”, Y.T.Seo, S.Jeong, J.K.Lee, H.S.Choi, J.Kim, **H.Y.Lee***, *Nano Convergence*, <https://doi.org/10.1186/s40580-018-0141-6> (2018)
3. “Polypyrrole Micro/Nano Sphere Arrays for High Performance Supercapacitor”, J.K.Lee, H.Jeong, A.Busnaina, R.Lavall, Y.L.Kim, Y.J.Jung, **H.Y.Lee***, *ACS Appl. Mater. Interfaces*, On-line published DOI: 10.1021/acsami.7b11574 (2017)
4. “Single microfluidic electrochemical sensorsystem for simultaneous multi-pulmonary hypertension biomarker analyses”, G.H.Lee, J.K.Lee, J.H.Kim, H.S.Choi, J.Kim, S.H.Lee, **H.Y.Lee***, *Scientific Reports*, 7:7545 (2017)
5. “Nonmediated, Label-free based Detection of Cardiovascular Biomarker in a Biological Sample”, J.K.Lee, S.R.Shin, A.Desalvo, G.H.Lee, J.Y.Lee, A.Polini, S.K.Chae, H.Jeong, J.Kim, H.S.Choi, **H.Y.Lee***, *Advanced Healthcare Material*, 700231-7 (2017)
6. “Label-free and Regenerative Electrochemical Microfluidic Biosensors for Continual Monitoring of Cell Secretomes”, S.R.Shin, T.Kilic, Y.S.Zhang, H.Avcı, N.Hu, D.Kim, C.Branco, J.Aleman, S.Massa, A.Silvestri, J.Kang, A.Desalvo, M.A.Hussaini, S.K.Chae, A.Polini, N.Bhise, M.A.Hussain, **H.Y.Lee**, M.R.Dokmeci, A.Khademhosseini, *Advanced Science*, 1600522 (2017)
7. “Role of fatty acid composites in the toxicity of titanium dioxide nanoparticles used in cosmetic products”, J.Chang, C.W.Lee, H. Alsulimani, J.E.Choi, J.K.Lee, A.Y.Kim, B.H.Park, J.Kim, **H.Y.Lee***, *The Journal of Toxicological Sciences*, 41(5), 5330542 (2016)

8. "Standardization of a bone formation biomarker Quantification using screen printed electrode", C.Bubar, J.K.Lee, **H.Y.Lee***, S.Shefelbine*, *Applied Spectroscopy Reviews*, 51 (7-9), 753-761 (2016)
9. "Pharmacokinetics, Pharmacodynamics and Toxicology of Theranostic Nanoparticles", H. Kang, S. Mintri, A.V.Menon, **H.Y.Lee**, H.Choi, J.Kim, *Nanoscale*, 7(45), 18848-62, (2015).
10. "AFM detection of Alzheimer Marker : Different Stages of Amyloid Beta Peptide on Mica Surface", J.K.Lee, H.B.Jeong, C.Bubar, A.Busnaina, **H.Y.Lee***, *Journal of Korean Physical Society*, 67(11), 1957-1960 (2015)
11. "An Impedimetric Nanosensor based on Large-Scale Nanowell Array Electrode for Single Nucleotide Polymorphism of Leptin", J.K.Lee, S.H.Cho, J.G.Park, S.H.Lim, A.Busnaina, J.H.Kim, **H.Y.Lee***, *International Journal of Emerging Engineering Research and Technology*, 2 (7), 283-287 (2015).
12. "Nanowell Array based Sensor and Its Packaging", J.K.Lee, T.Akira, M.Y.Jeong, **H.Y.Lee***, *J. Microelectron. Packag. Soc.*, 21(3), 1-6 (2014).
13. "Wafer-Scale Nanowell Array Patterning based Electrochemical Impedimetric Immunosensor", J.K.Lee, S.H.Cho, J.H.Lee, H.Y.Ryu, J.G.Park, S.H.Lim, B.D.Oh, C.W.Lee, W.Huang, A.Busnaina, **H.Y.Lee***, *Journal of Biotechnology*, 168, 584-588 (2013)
14. "Double Oxide Deposition and Etching Nanolithography for Wafer-scale Nanopatterning with high-Aspect-Ratio using Photolithography", J.H.Seo, H.C.Cho, J.K.Lee, J.Y.Lee, A.Busnaina, **H.Y.Lee***, *Appl. Phys. Lett.*, 103, 033105 (2013)
15. "Acceleration of Poly(L-lactide) Degradation by TiO₂ nanoparticle in sunlight", J.Y.Lee, J.K.Lee, B.H.Park, A.Busnaina, **H.Y.Lee***, *Journal of Nanoscience and Nanotechnology*, 13(10), 6983-6987 (2013)
16. "Study of Highly Selective and Sensitive Microarray Structure Based on Hydrophilic/Hydrophobic SAMs (Self-Assembled Monolayers) ", JH Lee, SH Cho, HW Lim, SW Kim, AA Busnaina, **H.Y.Lee**, JG Park, *Solid State Phenomena*, 195, 82-85 (2013)
17. "Quantitative Analysis of H5N1 DNA Hybridization on Nanowell Array Electrode", M.S.Cha, J.K.Lee, S.H.Cho, J.G.Park, **H.Y.Lee***, S.H.Lim*, Y.R.Yoon*, *Journal of Nanoscience and Nanotechnology*, 13(8), 5245-5249 (2013)
18. "Detection of single nucleotide polymorphisms using a biosensor containing titanium-well array", J.K.Lee, S.H.Cho, A.Y.Kim, J.H.Lee, J.H.Lee, B.H.Park*, J.G.Park*, **H.Y.Lee***, *Journal of Nanoscience and Nanotechnology*, 13(1), 139-143 (2013)
19. "Phospholipase-catalyzed Hydrolysis in an Membrane in the Presence of Melittin", J.Y.Lee, J.K.Lee, A.Busnaina, B.H.Park, **H.Y.Lee***, *Journal of Nanoscience and Nanotechnology*, 13(1), 144-148 (2013)
20. "Characterization of the GM1 pentasaccharide-Vibrio cholera toxin interaction using a carbohydrate-based electrochemical system", J.H.Seo, **H.Y.Lee*** and H.J. Cha*, *Analyst*, 137(12), 2860-2865 (2012)
21. "Interactive Configuration through Force Analysis of GM1 Pentasaccharide-Vibro cholera Toxin Interaction", J.H.Seo, C.S.Kim, **H.Y.Lee**, T.Kawai, H.J.Cha, *Analytical Chemistry*, 83, 6011-6017 (2011)
22. "Photocurable Polyhedral Oligomeric Silsesquioxane-based Resists for Nanoimprint Lithography: Fabrication of High-Aspect Ratio Structures and Replica Molds", B. K. Lee, N. G. Choa, H. Tanaka, N. Y.

- Hong, D. P. Kim, **H.Y.Lee***, T. Kawai, *Langmuir*, 26(18), 14915-14922 (2010)
23. "Replica Mold for Nanoimprint Lithography from a Novel Hybrid Resin", B. K. Lee, N. Y. Hong, **H.Y.Lee***, D. P. Kim*, T. Kawai*, *Langmuir*, 25(19), 11768-11776 (2009).
 24. "Direct Fabrication of Integrated Nanobox Arrays by Sidewall Deposition with Controllable Heights and Thicknesses", N. G. Choa, B. K. Lee, **H.Y.Lee**, T. Kawai, H. Tanaka*, *Nanotechnology*, 20, 395301-395307 (2009).
 25. "Nanoarrays of Tethered Lipid Bilayer Rafts on Poly(vinyl alcohol) Hydrogels", B. K. Lee, **H.Y.Lee ***, P. N. Kim, K. Y. Suh *, T. Kawai *, *Lab on a chip*, 9, 132-139 (2009).
 26. "Magnetic properties of the integrated (Fe, M)₃O₄ (M=Mn and Zn) nano-array structures in large area prepared by Nanoimprint lithography with Mo lift-off technique", Yamanaka, N.Suzuki, B.K.Lee, **H.Y.Lee**, Hide. Tanaka, T.Kawai, *Solid State Communications*, 149, 729-733 (2009).
 27. "Stepwise Self-Assembled Protein Nanoarray with a Nanoimprinted Poly (Ethylene Glycol) Hydrogel", B. K. Lee, **H.Y.Lee***, P. N. Kim, K. Y. Suh, J. H. Seo, H. J. Cha, T. Kawai, *Small*, 3, 342-348, (2008)
 28. "Epitaxial Nanodot Arrays of Transition-Metal Oxides Fabricated by Dry Deposition in combination with a Nanoimprint Lithography based olybdenum Lift-off Technique", N. Suzuki, Hide. Tanaka, S. Yamanaka, M. Kanai, B. K. Lee, **H.Y.Lee**, T. Kawai*, *Small*, 10, 1661-1665 (2008).
 29. "Self-organized Functional Lipid Vesicle Array for Sensitive Immunoassay chip", **H.Y.Lee ***, B. K. Lee, J. W. Park, H. S. Jung, T. Kawai*, *Ultramicroscopy*, 108, 1325-1327 (2008).
 30. "Limited nanofabrication of functional oxide", N. Suzuki, H. Tanaka, Y. Yanagisawa, L. Yamazaka, L. Pellegrino, B. K. Lee, **H.Y.Lee**, T. Kawai*, *Vacuum Society*, 51, 38-43 (2008).
 31. "Analytical studies of penicillamine enantiomer surfaces: the molecularly flat surface and the functionality", W. S. Kim, **H.Y.Lee**, T. Kawai, H. W. Kang, H. Muramatsu, I. H. Kim, K. M. Park, S. M. Chang, J. M. Kim*, *Sensors and Actuators, B:chemical*, 129, 126-133 (2008).
 32. "Molded nanowell electrodes for site-selective single liposome arrays", P. N. Kim, B. K. Lee, **H.Y.Lee ***, T. Kawai, and K. Y. Suh*, *Advanced Materials*, 20, 31-36 (2008). : Selected as Research Highlight in NPG Asia Materials
 33. "Single Probe DNA Immobilization on Chemically Modified Single Protein by controlling Ionic Strength and PH", R. Yamazaki, M. Ito, B. K. Lee, H. S. Jung, **H.Y.Lee***, T. Kawai*, *Analytica Chimica Acta*, 603, 76-81 (2007).
 34. "Facile and Rapid Direct Gold Surface Immobilization with Controlled Orientation for Carbohydrates", J. H. Seo, K. Adachi, B. K. Lee, D. G. Kim, Y. K. Kim, K. R. Lee, **H.Y.Lee***, T. Kawai, H. J. Choa*, *Bioconjugate Chemistry*, 18, 2197-2201 (2007).
 35. "Electrochemical detection of 17 β -estradiol using a DNA aptamer immobilized gold electrode chip", Y. S. Kim, H. S. Jung, T. Matura, **H.Y.Lee ***, T. Kawai, M. B. Gu*, *Biosensor and Bioelectronics*, 22, 2525-2531 (2007).
 36. "A review of DNA functionalized/Grafted Carbon Nanotubes and their characterization", S. Daniel, T. P. Rao, Kota S. Rao, S. U. Rani, G. R. K. Naidu, **H.Y.Lee***, T. Kawai*, *Sensors and actuator: B.Chemical*, 122, 672-682 (2007).

37. "Functional Lipid Vesicles Based on Artificial Electric-Taster Sensor", H. S. Jung, Hide. Tanaka, **H.Y.Lee***, and T. Kawai*, *Mol. Cryst. Liq. Cryst.*, 463, 271[553]-279[561] (2007).
38. "**Well-Oriented NanoWell Arrays Metrics for an Integrated Digital Nanobiosensor**", **H.Y.Lee ***, **J. W. Park**, **J. M. Kim**, **H. S. Jung**, **T. Kawai***, *Appl. Phys. Lett.*, **89**, 113901-113903 (2006).
39. "A novel route for immobilization of oligonucleotides onto modified silica nanoparticles", K. S. Rao*, S. U. Rani, D. K. Charyulu, K. N. Kumar, B. K. Lee, H.Y.Lee, T. Kawai, *Analytica Chimica Acta* ,576, 177-183 (2006).
40. "Atomic Force Microscopy Observation of Highly Arrayed Phospholipid Bilayer Vesicle on a Gold Surface", H. S. Jung, J. M. Kim, J. W. Park, S. E. Lee, H.Y.Lee *, R. Kuboi, T. Kawai*, *J.Biosci.Bioeng.*, 102, 28-33 (2006). (Fig.2; A Cover of JBB vol.102, No.1)
41. "Creation of nano-scale materials and devices by programmed self-organization", K. Ojima, K. Adachi, B. K. Lee, H.Y.Lee, M. Taniguchi, T. Matsumoto, T. Kawai*, Japan Journal of Surface Science, 27(3), 151-156 (2006)
42. "*Soft lithographic patterning of supported lipid bilayers onto a surface and inside microfluidic channels*", P. N. Kim, S. E. Lee, H. S. Jung, H.Y.Lee* T. Kawai, K. Y. Suh*, *Lab on a chip*, 6, 54-59 (2006).
43. "Dependence of Ionic Strength for Immobilization of Probing Oligonucleotides onto Streptavidine modified Surface", R. Yamasaki, J. M. Kim, H. S. Jung, H.Y.Lee, T. Kawai*, *Biochemical Engineering Journal*, 29, 125-128 (2006).
44. "Electrical Recognition of Label-Free Oligonucleotides upon Streptavidin Modified Electrode Surfaces", J. W. Park, H. S. Jung, H.Y.Lee*, T. Kawai*, *Biotechnology and Bioprocess Engineering*, 10, 505-509 (2005).
45. "Nano-Fabrication of Surface in Combination with Bottom-up Nanotechnology", Hide. Tanaka, H.Y.Lee, and T. Kawai*, *Surface Technology*, 56, 15-20 (2005).
46. "New Antibody Immobilization Method via Functional Liposome Layer For Specific Protein Assays", **H.Y.Lee***, H. S. Jung, K. Fujikawa, J. W. Park, J. M. Kim, T. Yukimasa, H. Sugihara and T. Kawai*, *Biosensor and Bioelectronics*, 21, 833-838 (2005).
47. "Amperometric Immunosensor for Direct Detection Based upon Functional Lipid Vesicles Immobilized on NanoWell Array Electrode", H. S. Jung, J. W. Park, J. M. Kim, **H.Y.Lee***, and T. Kawai*, *Langmuir (Article)*, 21, 6025-6029 (2005).
48. "Conductance measurement of a DNA network in nano-scale by point contact imaging atomic force microscopy", A. Terawaki, Y. Otsuka, **H.Y.Lee**, T. Matusmoto, Hide. Tanaka, T. Kawai*, *Appl. Phys. Lett.*, 86, 113901 (1 -3) (2005).
49. "Spontaneous Immobilization of Liposomes on Electron Beam Technique", J. M. Kim, H. S. Jung, J. W. Park, H. Oka, T. Yukimasa, **H.Y.Lee***, and T. Kawai*, *J. Am. Chem. Soc.(Article)* , 127 , 2358-2362 (2005).
50. "AFM Phase Lag Mapping for Protein-DNA Oligonucleotide Complexes", J. M. Kim, H. S. Jung, J. W. Park, **H.Y.Lee***, T. Kawai, *Analytica Chimica Acta*, 525, 151-157 (2004).
51. "SNPs feasibility of nonlabeled oligonucleotides by using electrochemical sensing", **H.Y.Lee***, J. W. Park

- and T. Kawai*, *Electroanalysis*, 16, 1999-2002 (2004).
52. "AFM imaging of nanostructure polypyrrole doughnuts shapes fabricated by direct electrochemical oxidation", K. Fujikawa, H. S. Jung, J. W. Park, J. M. Kim, H.Y.Lee*, and T. Kawai*, *Electrochem. Com.*, 6, 461-464 (2004).
 53. "Electrochemical assay of nonlabeled DNA chip and SNOM imaging by using streptavidin-biotin interaction", **H.Y.Lee** *, J. W. Park, H. S. Jung, J. M. Kim, T. Kawai, *J. Nanoscience and Nanotechnology*, 4, 882-885(2004).
 54. "Stable high ordered protein layers confirmed by atomic force microscopy and quartz crystal microbalance", J. M. Kim, R.Yamasaki, J. W. Park, H. S. Jung, **H.Y.Lee** *, T. Kawai*, *J.Biosci. Bioeng.*, 97, 140-142 (2004). (Fig.3; A Cover of JBB vol.97, No.6)
 55. "Electrochemical detection of nonlabeled oligonucleotide DNA using the biotin-modified DNA on streptavidin-modified gold electrode", J.W.Park, **H.Y.Lee***, J. M. Kim, R. Yamasaki, T. Kanno, Hiro. Tanaka, Hide. Tanaka, T. Kawai*, *J.Biosci. Bioeng.*, 97, 29-32 (2004).
 56. "Near-field optical imaging of abasic sites on a single DNA molecule", J. M. Kim, **H.Y.Lee***, H. Muramatsu*, T. Kawai , *FEBS LETTER*, 555, 611-615 (2003).
 57. "CuPc/PbZr_{0.2}Ti_{0.8}/(La, Ba)MnO₃ field effect transistor heterojunction photomemory", Y. G. Park, T. Kanki, **H.Y.Lee**, Hide. Tanaka and T. Kawai*, *Solid State Electronics*, 47, 2221-2224 (2003).
 58. "Photoinduced ferroelectric hysteresis curve in organic photoconductor/inorganic ferroelectric heterojunction photomemory, Y. G. Park, **H.Y.Lee**, H. Tanaka, H. Tabata, T. Kawai*, *J. Kor. Phys. Soc.*, 42, S1382-S1385 (2003).
 59. "Investigations on the nature of observed ferromagnetism and possible spin polarization in Co-doped anatase TiO₂ thin films", D. H. Kim, J. S. Yang, K. W. Lee, S. D. Bu, D. W. Kim, T. W. Noh*, S. J. Oh, Y. W. Kim, J. S. Chung, H. Tanaka, **H.Y.Lee**, T. Kawai, J. Y. Won, S. H. Park, J. C. Lee, *J. Appl. Phys.*, 93, 6125-6132 (2003).
 60. "Electrical properties of poly(dA)-poly(dT) and poly(dG)-poly(dC) DNA doped with iodine molecules", M. Taniguchi, **H.Y.Lee**, H. Tanaka, T. Kawai*, *Jpn. J. Appl. Phys.*, 42, 215-216 (2003).
 61. "DNA directed magnetic network formations with ferromagnetic nanoparticles", H.Y.Lee, Y. Sacho, T. Kanki, H. Tanaka, H. Shirakawa, J. W. Cheon, J. H. Yoon, N. J. Kang, I. Park, T. Kawai*, *J. Nanoscience and Nanotechnology*, 2, 613-615 (2002).
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 63. "Photoinduced ferroelectric hysteresis curve in organic CuPc photoconductor/ inorganic BaTiO₃ ferroelectric heterojunction photomemory", Y. G. Park, H.Y.Lee, H. Tanaka, H. Tabata, T. Kawai*, *Appl. Phys. Lett.*, 81 ,1318-1320(2002).
 64. "Humidity effects on the conductance of the assembly of DNA molecules", D. H. Ha, H. Nham, K. H. Yoo, H. M. So, H.Y.Lee, T. Kawai*, *Chem. Phys. Lett.*, 355, 405-409(2002).

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66. "Influence of humidity on the electrical conductivity of synthesized DNA film on nanogap electrode", Y. Otsuka, H.Y.Lee, J. H. Gu, J. O. Lee, K. H. Yoo, H. Tanaka, H. Tabata, T. Kawai*, *Jpn. J. Appl. Phys.*, 41, 891-894(2002).
67. "Electrical conduction through poly(dA)-poly(dT) and poly(dG)-poly(dC) DNA molecules", K. H. Yoo, D. H. Ha, J. O. Lee, J. W. Park, J. H. Kim, J. J. Kim, H.Y.Lee, T. Kawai*, *Phys. Rev. Lett.*, 87, 198102(1-4) (2001).
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69. "Optical microstructure of CuPc thin film prepared by thermal evaporation", H.Y.Lee, Y. S. Kang, H. Tanaka, T. Kawai*, *Mol. Cryst. and Liq. Cryst.*, 371, 247-251(2001).
70. "Variation of the orientation and in-plane photocurrent properties of PbTe/CuPc heterostructure with the growth condition", H.Y.Lee, Y. S. Kang, M. S. Jang, H. Tanaka, H. Tabata, T. Kawai*, *J. Korean Phys. Soc.*, 37, 475-477 (2000).
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76. "Crystalline structure and electric properties of PbSe thin films prepared using PLD system", J.M.Park, H.Y.Lee, J. H.Jeong*, *The Korean Sensor Society*, 8, 50-52 (1999).
77. "Structural and electrical properties of PbTe thin film according to the substrate temperature", H.Y.Lee, B.C.Choi, J.H.Jeong*, *The Korean Sensor Society*, 6, 407-410 (1999).
78. "Structural and dielectric properties of Bi₂VO_{5.5} thin films and Bi₂VO_{5.5} ceramics", Y.G.Park, J.H.Park, B.C.Choi, J. H.Jeong, H.Y.Lee, Y. S. Kang*, I. W. Kim, J. S. Kim, *J. Korean Phys. Soc.*, 35, S1239-1242 (1999).
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80. "Photoelectric properties by interface effect of organic/inorganic(CuPc/ PbTe) multilayer prepared by pulsed

- laser deposition and thermal evaporation", **H.Y.Lee**, Y. S. Kang, B. C. Choi, J. H. Jeong, H. Tabata, T. Kawai*, *J. Korean Phys. Soc.*, 34, S64-67 (1999).
81. "Preparation of NbS₂ thin film using PLD method", J. M. Park, **H.Y.Lee**, J. H. Jeong*, *The Korean Sensor Society*, 7, 372-375 (1998).
82. "Photoelectric conversion properties and structural of copper phthalocyanine", **H.Y.Lee**, Y. S. Kang, B. C. Choi, J. H. Jeong*, *Saemulli*, 38, 23-26 (1998).
83. "Photoelectric properties of CuPc/PbTe bilayer, **H.Y.Lee**", Y. S. Kang, J. K. Lee, J. H. Jeong*, *The Korean Sensor Society*, 7, 67-70 (1998).
84. "Preparation and properties of CuPc/PbTe multilayer thin film by laser ablation and thermal evaporation", **H.Y.Lee**, H. Tabata, T. Matsumoto, T. Kawai*, *Jpn. J. Appl. Phys.*, 36, 5156-5162 (1997).
85. "Structural and photoelectrical properties of copper phthalocyanine (CuPc) thin film on p-Si substrate by thermal evaporation", **H.Y.Lee**, J. K. Lee, J. H. Jeong*, *The Korean Sensor Society*, 6, 407-410 (1997).
86. "Photoelectronic conversion properties of CuPc/PbTe multilayer thin film", **H.Y.Lee**, and T. Kawai*, *J. Appl. Phys.*, 80, 3601-3603 (1996).
87. "Preparation of transition metal chalcogenide thin film by pulsed laser ablation", **H.Y.Lee**, M. Kanai, and T. Kawai*, *Thin Solid Films*, 277, 98-100 (1996).
88. "Growth of oriented NiS films on Si(111) and Al₂O₃(012) substrates by pulsed laser ablation", **H.Y.Lee**, M. Kanai, T. Kawai, S. Kawai*, *Jpn. J. Appl. Phys.*, 32, 2100-2101 (1993).
89. "Structure of tripotassium hexahydrogenhexamolybdoaluminate (III) heptahydrate", **H.Y.Lee**, K. M. Park, U. Lee*, H. Ichida, *Acta. Cry.*, C47, 1959-1961 (1991).

Conference Proceeding (peer reviewed):

90. "NanoWell Array-based Digital BioChip Platform", **H.Y.Lee**, T. Kawai, *Proceedings of the 9th WSEAS International Conference: Theory & Application* (2008). (Invited paper)
91. "Facile and Rapid Direct Gold Surface Immobilization with Controlled Orientation for Carbohydrates", J. H. Seo, K. Adachi, B. K. Lee, D. G. Kang, Y. K. Kim, K. R. Kim, **H.Y.Lee**, T. Kawai, H. J. Choa, *EDIS2008 Proceeding (The 1st Global COE International Symposium-Electronic Devices Innovation)*, 135-136 (2008).
92. "Integrated Electronic-Nanowell BioCHIP", **H.Y.Lee**, B. K. Lee, T. Kawai, *EDIS2008 Proceeding (The 1st Global COE International Symposium-Electronic Devices Innovation)*, 133-134 (2008).
93. "Development of aptmer-based biosensor using nanowell gold chip for 17 beta estradiol detection", M. B. Gu, Y. S. Kim, H. S. Jung, **H.Y.Lee**, T. Kawai, *Abstract of papers of the American chemical society*, 229, U232, (2005).
94. "Electrochemical detection of non-labeling DNA using electronic array", **H.Y.Lee**, J. W. Park, Y. S. Choi, T. Kanno, Hiro. Tanaka, Hide. Tanaka, T. Kawai, *Mat. Res. Soc. Symp. Proc.*, 735, 15-19 (2003).
95. "Construction of five senses sensors and brain mimetic memory using Nanotechnology", H. Tanaka, Y. G. Park, T. Watanabe, **H.Y.Lee**, H. Tabata, T. Kawai, *Proceedings of the 19th sensor symposium*, 23-28 (2002).

Magazine Articles:

96. "Recent trend in biochip research/development/application", H.Y.Lee, T. Kawai, *OHM (Journal of Technology)*, 33-41(2004).

INVITED TALKS AT CONFERENCE

1. "Nanobiomedical Device System for Nanomedicine and Innovative Business" The 18TH Biotechnology Congress, 2017.10-19, Hilton New York, US
2. "A Scalable Nanowell Array based Portable Point-Of-Care Nanosensor" The 26TH KSEA Northeast regional conference, 2017.4.29, New Jersey Institute of Technology, NJ, US
3. "Digitized Nanobiomedical Device for Personalized Nanomedicine" The 2nd International Conference & Exhibition for Nanopia, 2015.11.12-13, ChangWon, Korea
4. "Regenerable Electrochemical Nanosensor for Long-Term Monitoring" The 1st International Conference & Exhibition for Nanopia, 2014.11.13-14, ChangWon, Korea
5. "*Nanomaterial Device based on Regenerative Nanowell Array Electrodes*" CNV- Convergence Technology Symposium, UKC(US-Korea) Conference, 2014.8.6-10, San Francisco, CA, US
6. "*Smart Nanobiomedical Systems based on Nanowell Array Device*" 1st International Conference on Nano-Bio-Medical Convergence, 2014.2.24-25, Busan, Korea,
7. "*Digitized Nanobiomedical Device based on Double Oxide Deposition and Etching Method*" , Biotronics 2013, International conference on biosensors, biochips, and bioelectronic devices, 2013.7.5, Seoul, Korea
8. "*Nanobiomedical Device for Personalized Nanomedicine*", the SPIE Nanosystems in Engineering + Medicine Congress-2012, 2012.9-13, Seoul, South Korea. **[Keynote speaker]**
9. "*Digitized Nanobiomedical Device Toward Nontoxic Diagnostics*" 5th International Conference on Sensors, ASIASENSE 2011, 2011.10. 23-26, Jeju, South Korea.
10. "*Evaluation of Safety of Cosmedical Product using Titanium Dioxide Nanoparticles on human skin and lung cell*" The 2nd Noble Nanosafety Workshop for R&D, Korea Institute of Toxicology(KIT), Center for Inhalation Toxicology, 2011. 10.13-14, Jeongeup campus, South Korea.
11. "*The Safety test of Titanium Dioxide Nanoparticles on human skin-derived cell* ", 1th Noble Nanosafety Workshop for R&D, Konkuk University, 2011.8.17. Seoul, South Korea.
12. "*Self-Assembled Protein nanoarray for Advanced Manomedical Device*", ISMM 2011 in conjunction with the KBCS Spring Meeting, 2011.6. 2-4. Seoul Kyoyuk Munhwa Hoekwan, Seoul, South Korea.
13. "*Molecular Biotechnology based on Nanowell Structure*", Symposium of Advanced Nanobiotechnology and Its Potential Applications, 2010.11.25. Korea University, Seoul, South Korea.
14. "*Addressable Lipid Rafts Nanoarrays Toward Nanomedicine*", IUMRS2010 (International Union of Materials Research Societies), Self-assembling Materials and Processes from Fundamental Phenomena to Nanomanufacturing, 2010.8.23-26. Seoul, South Korea.
15. "*Minute Signal Detection of Biomolecules Toward Advanced Nanobiodevices*", 1st WCU&NCRC Co-Workshop on "Sensors& their application for human interface system", Sungkyunkwan University, 2010.2.24. Suwon, South Korea.
16. "*Artificial Cell Membrane Nanoarrays Toward Advanced Nanomedicine*", 1st WCU Workshop on "Quantum Physics and Devices", Konkuk University, 2009.10.28. Seoul, South Korea.
17. "*Biomimetic Nanowell Array Chip based on Digital Signal toward Nanomedicine*", The second

- Korea-Israel Workshop on "Cells & Molecules, Chips & sensors: innovative platforms for interfacing biology", 2009.10.26. The Hebrew University of Jerusalem, Israel.
18. "*Bio-Nanodevices using QCM*", QCM Research Workshop; Research of molecular interaction by QCM ~from biomolecules to materials, 2009.9.25. Tokyo, Japan.
 19. "*Nanowell Array Biodevices Integrated Top-down and Bottom-up Technology*", Nano-Bio based Fusion Technology Conference, 2009.6.18-19. Boston, USA.
 20. "*Advanced Bio-Devices Toward Single Molecular Assay*", **Biotronics2008, 2008.10.8. Jeju, South Korea. [Keynote speaker]**
 21. "*Nano-Biochips Integrated through Soft lithography and Programmed Self-organization toward Single Molecular Analysis*", **The 2nd Thailand Nanotechnology Conference, 2008.8.10-14. Fuket, Thailand. [Keynote speaker]**
 22. "*Integrated Biocompatible Nanobiochip*", **The 3rd CNU-SANKEN Joint Symposium on Advanced Materials Science, 2008.2.27, Daejeon, South Korea.**
 23. "*NanoWell based Electrochemical NanobioCHIP toward multi-Nanomedicine*", **The 6th Japan-Korea Nanotech Industrialization Forum, 2008.2.14. Tokyo, Japan.**
 24. "*Integrated Electric NanobiosensorCHIP*", **Korea-MRS, 2007.11. Suwon, South Korea. [Plenary Lecture]**
 25. "*Self-assembled Biomolecule Nanoarray for Electronic Biochips*", **The 3rd Nanoelectronics and Dynamics of DNA, 2007.8.21. Hawaii. USA.**
 26. "*Soft Nanolithographic Patterning based Electronic Biosensor*", **The 2nd Nanoelectronics and Dynamics of DNA, 2006.8.21. Maui, USA.**
 27. "*An Integrated Digital Nanobiosensor with Functional Vesicle onto a Surface and inside Microfluidic Channels using Oriented NanoWell Array*", **The 6th International Symposium on Advanced Environmental Monitoring, 2006.6.29. Heidelberg, Germany.**
 28. "*Development of Electric Nano-Biosensor on Biomimetic Modified Surface*", **International Symposium on Biocatalysis and Bioprocess Engineering (ISBBE 2005), 2005.10. Shanghai, China.**
 29. "*Architecture Electronic-BioSensor Integrated with Nanofabrication*", **Summer Seminar of Biochemical Engineering Society, 2005.7.23. Kyoto, Japan.**
 30. "*Intelligent Nano Electric-Biosensor on Biomimetic Modified Surface*", **The 1st CNU-SANKEN Joint Symposium Advanced Materials Science, 2005.11.2. Daejeon, South Korea.**
 31. "*Enhancement of Integrated Electric Gene Chip Utilizing Nano-Well Array Geometry*", **The Nanoelectronics and Dynamics of DNA, 2005.8.23. Hawaii, USA.**
 32. "*E-beam Exposed Blocking Layer Based on Immobilization of liposome and Specific Antibody-Antigen Interaction*", **International Conference of molecule-Based Information Transmission and Reception (MB-ITR2005) - Surface and Interface in Nano-Bioelectrocincs, 2005.3.4. Okazaki, Japan.**
 33. "*Nanowells Array-based Ultrasensitive Electrical Bioassay*", **Workshop of Nanobioelectronic Devices, 2004.6.21. Seoul, South Korea.**
 34. "*Development of electrochemical DNA nanochip protocol for SNPs assay*", **The Korean Physical Society-2003 fall meeting, 2003.10.25. Daegu, South Korea.**
 35. "*DNA nanotechnology: application for nanoscale molecular circuit and genome detection*", **The Korean Physical Society-2002 fall meeting, 2002.10.25. Seoul, South Korea.**
 36. "*Electric transport of 2D-DNA network and DNA thin film with hole doping*", **Workshop of chemistry of**

molecular electronics, 2002.12.6. Hokkaido, Japan.

37. *"Electrical characteristics of DNA molecule"*, The international conference of molecular electronics and devices (ME&D), 2001.5.19. Pusan, South Korea.

INVITED SEMINARS AT UNIVERSITIES AND COMPANIES

38. *"Digital Nanobiomedical System for Personalized Nanomedicine"*, Special invited seminar, Pusan National University, 2017. 7.3. Pusan, South Korea
39. *"Smart Nanobiomedical-Sensor Systems for Personalized Health Care "*, Special invited seminar, 2017.6.27, National Center for Efficacy Evaluation of Respiratory Disease Product, Korea Institute of Toxicology, Jeongeup, South Korea
40. *"Digitized Nanobiomedical Device for Personalized Nanomedicine"*, Special invited seminar, 2017.6.26, Korea Institute of oriental Medicine, Deajeon, Pusan, South Korea
41. "Smart Nanobiomedical Sensor System" 2017 Korean-American Women in Science and Engineering NY/NJ Chapter Seminar, 2017.5.20, Rutgers, The State University of New Jersey, NJ, US
42. *"Personalized Nanomedicine using Nanowell Array Electrode"*, 2016.9.21, Detroit R&D. Inc, Michigan, USA.
43. *"Regenerable Electrochemical Nanobiosensor for Continual Monitoring"*, 2014.11.7, BODITECH Med. Inc, ChunCheon, Korea.
44. *"Minute Signaling Recognition for Smart Nanobiomedical-Device Systems"*, 2014.7.18. à l'Institut des Nanotechnologies de Lyon. French
45. *"Digitized Nanobiomedical Device for Personalized Nanomedicine"*, Special invited seminar, Pusan National University, 2013.2.12. Pusan, South Korea.
46. *"Understanding the Molecular Relationship in Carbohydrate-Ctx using SPM"*, Special invited seminar, Park SYSTEMS, 2012.6.8. Suwon, South Korea.
47. *"Digitized Nanobiomedical Device Toward Nontoxic Diagnostics"*, Special invited seminar, KRIBB (Korea research Institute Bioscience & Biotechnology), Nanobiotechnology Research Center, 2011.11.10. DaeJeon, South Korea.
48. *"Digitized Nanobiomedical Device Toward Nanomedicine"*, Special invited seminar, Nanomaterial fabrication process session, Hoseo University, 2011.11.8. CheonAnn, South Korea.
49. *"Digitized Nanobiomedical Device Toward Nontoxic Diagnostics "*, Special invited seminar, Materials Science and Engineering, Yonsei University, 2011.10.17. Seoul. South Korea.
50. *"Specific Pathogen Recognition on Single-Step Modified Carbohydrate Nanodevice"*, Special invited seminar, Department of Molecular Biotechnology, Division of Applied Bioscience and Biotechnology, Chonnam National University, 2011.10.14. KwangJu University, South Korea.
51. *"Minute Signaling Recognition for Smart nanobiomedicine Device System"*, Special invited seminar, Medical School, Korea University, 2011.9.19. Seoul. Korea.
52. *Recognition for Smart nanobiomedicine Device System"*, Special invited seminar, National Creative Research Center of Applied Microfluidic Chemistry, Chungnam National University, 2011.9.15. Daejeon, South Korea.
53. *"Minute Signaling Recognition for Smart Bio-Device System"*, Special invited seminar, Allmedicus, 2011.8.22. AnnYang, Korea.

54. *"Nano-Biomeical System Toward Nontoxic Diagnostcs and Therapedtics"*, Special invited seminar, Department of Nanobiotechnology, Hanyang University, 2011.4.27, Ansan, South Korea.
55. *"Toward Commercialization using Nanowell Array based Nanobiosensor "*, Special invited seminar, Abnova company, 2011.2.19. Taipei, Taiwan.
56. *"Future Vision and Present, History of ISIR-SANKEN, Osaka University, Japan "*, Special invited seminar, Research Center for Dielectric and Advanced Matter Physics, Pusan National University, 2011.1. 5. Pusan, South Korea.
57. *"Molecular Biotechnology based on Nanowell Structure"*, Special invited seminar, Graduate School of Advanced Sciences of Matter, Hiroshima University, 2010.11.3. Hiroshima, Japan.
58. *"Nanowell Array Biodevice based on Materials Chemistry"*, Special invited seminar, Institute for Materials Chemistry and Engineering (IMCE), Kyushu University, 2010.8.17. Kyushu, Japan.
59. *"Nanowell array biodevice based on materials chemistry"*, Special invited seminar, Department of Chemical & Biological Engineering, International Center for Converging Technology, Korea University, 2010.9.28. Seoul, South Korea.
60. *"Nanobiosensor Toward Nanomedicine"*, Special invited seminar, Center for Materials and Processes of Self-Assembly, Kookmin University, 2010.3.19. Seoul, South Korea.
61. *"Biomedical Nanodevice System Toward Nontoxic Diagnostcs and Therapeutics"*, Special invited seminar, Pusan National University, 2009.11.11. Pusan, South Korea.
62. ***"Biomedical Nanodevice System Toward Nontoxic Diagnostcs and Therapeutics"***, Special invited seminar, Bionano Research Institute, Kyungwon University, 2009.6.4. Seoul, South Korea.
63. ***"Addressable Lipid Rafts Nanoarrays for Advanced Nanomedicine"***, Special invited seminar, Division of Marin Molecular Biotechnology, Kangrung University, 2009.4.28. Kangung, South Korea.
64. ***"Addressable Lipid Rafts Nanoarrays for Advanced Nanomedicine"***, Special invited seminar, Microbiochip Center, Hanyang University, 2009.4.23. Seoul, South Korea.
65. *"Biocompatible Nanopatterning for Advanced NanoBioDevices"*, Special Invited Seminar, Department of Chemical Engineering, Chungnam University, 2009.3.24. Daejeon, South Korea.
66. *"Combinatorial Bio-Engineering based on Nanowell Array Structure"*, Special invited seminar, Department of Biotechnology, Osaka University, 2008.11.25. Osaka, Japan.
67. *"Nanosocket Geometry based Digital BioChip-Devices"*, Special Invited Seminar, Department of Chemical Engineering, Pohang University of Science and Technology (POSTECH), 2008.10.9. Pohang, South Korea.
68. ***"Well-Oriented NanoWell Array Metrics for Digital NanoBioChip"***, Special invited seminar, Department of bioengineering, Korea University, 2008.5.17. Seoul, Korea.
69. ***"Well-Oriented NanoWell Array Metrics for Digital NanoBioChip"***, Special invited seminar, Nanoscience and technology Institute, Seoul National University, 2008.5.16. Seoul, South Korea.
70. ***"Well-Oriented NanoWell Array Metrics for Digital NanoBioChip"***, Special invited seminar, Microbiochip Center, Hanyang University, 2008.5.15. Seoul, South Korea.
71. ***"Toward Digital NanoBioCHIP"***, Invited Seminar, Department of veterinary and biomedical science, Penn State Neuroscience Institute, The Pennsylvania State University, 2008.3.14. USA.
72. *"Well-Oriented NanoWell Array Metrics for Integrated Digital Nanobiosensor"*, Special invited seminar, Center of Scientific Orsay, Paris University, 2006.6.26. Paris, France.
73. *"Architecture Electronic-BioSensor Integrated with Nanofabrication"*, Special invited seminar, National

Center for Nanomaterials Technology (NCNT), Pohang University of Science and Technology (POSTECH) Consortium, 2006.2.3. Pohang, South Korea.

74. "Electrochemical protocol for detecting nonlabeled oligonucleotide *DNA chip*", Special invited seminar, Nano Bioelectronics & Systems Research Center, Seoul National University, 2003.8.11. Seoul, South Korea.
75. "*Electrical characteristics of DNA molecule*", LG Electronic Institute of Technology, BioElectronics Group, 2001.8.20. Seoul, South Korea.
76. "*Photoconversion properties of CuPc/PbTe multilayer thin film by laser ablation and thermal evaporation*", Special invited seminar, Research Center for Dielectric and Advanced Matter Physics, Pusan National University, 1999.7.1. Pusan, South Korea.
77. "*Preparation and properties of CuPc/PbTe multilayer thin film by laser ablation and thermal evaporation*", Special invited seminar, Department of Physics, Pohang University of Science and Technology (POSTECH), 1999.10.25. Pusan, South Korea.
78. "*Preparation and properties of CuPc/PbTe multilayer thin film by laser ablation and thermal evaporation*", Special invited seminar, Department of Chemistry, Shinra University, 1998.1.20. Pusan, South Korea.
79. "*Photoelectric conversion properties and structural of copper phthalocyanine*", Special invited seminar, Department of Physics, Ulsan University, 1996.5.20. Ulsan, South Korea.
80. "*Photoelectric conversion properties of CuPc/PbTe bilayer*", Special invited seminar, Department of Chemistry, Pukyong National University, 1996.4.1. Pusan, South Korea.