

# KHINO PAROHINOG

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## CORE COMPETENCIES

Material Design • Material Synthesis • Material Testing • Water Quality Analysis  
Laboratory Management • Laboratory Investigation • Continuous Improvement  
Supply Chain Management • Safety Analysis • Equipment Management

## EDUCATION

*Integrated MSc-PhD in Energy Science and Technology (에너지융합공학 공학박사)*

**Myongji University** • Yongin City, Gyeonggi Province, South Korea

March 2015 – February 2022 (*Expected*)

Research Focus: Design, synthesis, and application of crown ether-functionalized carbon nanomaterial-based composite adsorbents for targeted metal ion recovery.

PhD Advisor: Professor Wook-Jin Chung

*Bachelor of Science in Chemical Engineering with specialization in Environmental Engineering*

**University of St. La Salle** • Bacolod City, Negros Occidental, Philippines

June 2005 – March 2010

## PROFESSIONAL EXPERIENCE

*Fabric & Home Care Distribution Requirements Planner – Supply Network Organization*

**Procter & Gamble Philippines Inc** (Cabayao, Laguna, Philippines)

- Managed the largest export product category of the P&G Cabuyao Plant.
- Improved the CFR and mitigated the impact of the long-term port congestion issue and was able to stabilize the supply network in multiple destination countries and distribution centers.
- Led the maintenance of the product validity in the DRP network, by creating replenishment recommendations for distribution centers, considering current inventories, inventory targets, current orders, demand forecast, in-transit inventory, lot size, sourcing strategy, and replenishment lead time. This helped in the transition of the DRP work process to SAP-based planning.

June 2014 –  
March 2015

***Inbound Logistics Engineer – Supply Network Organization***

**Procter & Gamble Philippines Inc** (Cabuyao, Laguna, Philippines)

- September 2013  
– May 2014
- Managed the warehouse operations for 2 Business Units (F&HC and Baby Care) including the in-house warehouse and the outside material hub warehouse.
  - Led the warehouse management of the Baby Care Business unit as the IBL SPOC. Addressed all operational concerns regarding the Baby care warehouse management
  - Led the Supplier Managed Inventory system for adhesive materials, resulting to reduced effort in managing the inventory of the different adhesives.
  - Trained the Team Leaders of the 3rd party warehouse and logistics provider before hand-over of IBL operations.

***Quality Assurance Engineer – Quality Assurance Organization***

**Procter & Gamble Philippines Inc** (Cabuyao, Laguna, Philippines)

- April 2011 –  
August 2013
- Conducts testing and releasing of Raw Materials and Finished Products.
  - Managed different Site-wide system ownerships for QA Laboratory operations and provided monthly reports to the QA leadership team regarding the results and outages for each system ownership.
  - Led the Analytical Initiatives Readiness for every formulation/process change in the F&HC BU (Fabric Enhancer and Dish Care Categories), providing the leadership team the readiness timeline for analytical qualification. Led the analytical qualification of the other QA Engineers for new analytical techniques and procedures. Resulted to 100% on-time QA Engineer qualification and zero delays in initiative launches due to QA-related items.

**TEACHING ASSISTANCE EXPERIENCE**

***Graduate Teaching Assistant - Department of Energy Science and Technology***

**Myongji University** (Yongin City, Gyeonggi Province, South Korea) • (Multiple Semesters, 2016-2019)

- **Technical Writing and Presentation in English** (GE130010 *under Grace M. Nisola, PhD*). Spring Semester 2019 and Spring Semester 2016
- **Separation technology in Adsorption and Ion Exchange** (GE130046 *under Grace M. Nisola, PhD*). Fall Semester 2018
- **Advanced Software Application in Energy and Environmental Research** (GE130054 *under Grace M. Nisola, PhD*). Spring Semester 2018
- **Instrumental Analysis for Inorganic Materials** (GE130011 *under Wook-Jin Chung, PhD*). Spring Semester 2018
- **Membrane Technology for Energy and Environmental Application** (GE130044 *under Grace M. Nisola, PhD*). Fall Semester, 2017
- **Selected Topics in Fusion Technology 2** (GE130007 *under Wook-Jin Chung, PhD*). Fall Semester, 2017
- **Selected Topics in Fusion Technology 1** (GE130006 *under Jeong-gil Seo, PhD*). Spring Semester, 2017

## PEER-REVIEWED PUBLICATION LIST

Total citation= 202 ; h-index= 6; Database: Google Scholar

- (1) Nisola, G. M.<sup>1</sup>, **Parohinog, K. J.**<sup>1</sup>, Torrejos, R.E.C., Koo, S., Lee, S.-P. †; Kim, H. †, Chung, W.-J<sup>†</sup>. Crown ethers “clicked” on fibrous polyglycidyl methacrylate for selective Li<sup>+</sup> retrieval from aqueous sources. *Colloids Surf., A* **2020**, 124709. <https://doi.org/10.1016/j.colsurfa.2020.124709>. <sup>1</sup>co-first author
- (2) Nisola, G. M.<sup>1</sup>, **Parohinog, K. J.**<sup>1</sup>, Burnea, F.K., Lee, J.Y., Cho, M.K., Seo, J.G. †, Lee, S.-P. †; Chung, W.-J<sup>†</sup>. Covalently decorated crown ethers on magnetic graphene oxides as bi-functional adsorbents with ion recognition properties for selective capture of metal ions in water. *Chem. Eng. J.* **2019**, 389, 123421. <https://doi.org/10.1016/j.cej.2019.123421>. <sup>1</sup>co-first author
- (3) Escobar, E.C.<sup>1</sup>, Sio, J.E.L.<sup>1</sup>, **Parohinog, K.**, Rajkamal, A., Kim, H., Chung, W.-J.<sup>†</sup>, Nisola, G.M<sup>†</sup>. Hyper-crosslinked tetraphenylborate as a regenerable sorbent for Cs<sup>+</sup> sequestration in aqueous media through cation- $\pi$  interactions. *Chemosphere*, **2021**, 132501. <https://doi.org/10.1016/j.chemosphere.2021.132501>.
- (4) Torrejos, R.E.C., Escobar, E.C., Han, J.W., Min, S.H., Yook, H.W., **Parohinog, K.J.**, Koo, S.H., Kim, H., Nisola, G.M.<sup>†</sup>, Chung, W.-J<sup>†</sup>. Multidentate thia-crown ethers as hyper-crosslinked macroporous adsorbent resins for the efficient Pd/Pt recovery and separation from highly acidic spent automotive catalyst leachate. *Chem. Eng. J.* **2021**, 130379. <https://doi.org/10.1016/j.cej.2021.130379>.
- (5) Limjuco, L. A., Nisola, G. M., **Parohinog, K. J.**, Valdehuesa, K. N. G., Lee, S.-P. Kim, H., Chung, W.-J<sup>†</sup>. Water-Insoluble Hydrophilic Polysulfides as Microfibrous Composites towards Highly Effective and Practical Hg<sup>2+</sup> Capture. *Chem. Eng. J.* **2019**, 378, 122216. <https://doi.org/10.1016/j.cej.2019.122216>.
- (6) Torrejos, R. E. C.; Nisola, G. M.; Min, S. H.; Han, J. W.; Koo, S.; **Parohinog, K. J.**; Lee, S.; Kim, H.; Chung, W.-J<sup>†</sup>. Aqueous Synthesis of 14-15-Membered Crown Ethers with Mixed O, N and S Heteroatoms: Experimental and Theoretical Binding Studies with Platinum-Group Metals. *Chempluschem* **2019**, 84 (2), 210–221. <https://doi.org/10.1002/cplu.201800541>.
- (7) Limjuco, L. A.; Nisola, G. M.; Torrejos, R. E. C.; Han, J. W.; Song, H. S.; **Parohinog, K. J.**; Koo, S.; Lee, S. P.; Chung, W. J<sup>†</sup>. Aerosol Cross-Linked Crown Ether Diols Melded with Poly(Vinyl Alcohol) as Specialized Microfibrous Li<sup>+</sup> Adsorbents. *ACS Appl. Mater. Interfaces* **2017**, 9 (49), 42862–42874. <https://doi.org/10.1021/acsami.7b14858>.
- (8) Torrejos, R.E.C.; Nisola, G.M.; Song, H.S.; Limjuco, L.A.; Lawagon, C.P.; **Parohinog, K.J.**; Koo, S.; Han, J.W.; Chung, W.-J<sup>†</sup>. Design of Lithium Selective Crown Ethers: Synthesis, Extraction and Theoretical Binding Studies. *Chem. Eng. J.* **2017**, 326, 921–933. <https://doi.org/10.1016/j.cej.2017.06.005>.
- (9) Chung, W. J.; Torrejos, R. E. C.; Park, M. J.; Vivas, E. L.; Limjuco, L. A.; Lawagon, C. P.; **Parohinog, K. J.**; Lee, S. P.; Shon, H. K.; Kim, H.; Nisola, G.M.<sup>†</sup> Continuous Lithium Mining from Aqueous Resources by an Adsorbent Filter with a 3D Polymeric Nanofiber Network Infused with Ion Sieves. *Chem. Eng. J.* **2017**, 309, 49–62. <https://doi.org/10.1016/j.cej.2016.09.133>.

- (10) Thakur, A. K.; Nisola, G.M.; Limjuco, L.A.; **Parohinog, K.J.**; Torrejos, R.E.C.; Shahi, V.K.; Chung, W.-J.<sup>†</sup> Polyethylenimine-Modified Mesoporous Silica Adsorbent for Simultaneous Removal of Cd(II) and Ni(II) from Aqueous Solution. *J. Ind. Eng. Chem.* **2017**, *49*, 133–144. <https://doi.org/10.1016/j.jiec.2017.01.019>.

## PATENTS

- (1) Chung, W.-J., Torrejos, R.E.C., Nisola, G.M., Limjuco, L.A., **Parohinog, K.J.**, Lawagon, C. P., Koo, S., 2017. Macroporous hypercrosslinked crown ether epoxy polymer resin and lithium absorbent including the same (거대 다공성의 가교된 크라운 에테르 에폭시 폴리머 수지 및 이를 포함하는 리튬 흡착제). Korean Patent 10-2074869-0000 filed April 26, 2018 and issued February 7, 2020.
- (2) Chung, W.-J., Nisola, G.M., **Parohinog, K.J.**, Lee S.P., Torrejos R.E.C., Limjuco, L.A., Seo, J.G., 2019. Lithium ion adsorbent, method for preparing thereof and application thereof (리튬 이온 흡착제, 이의 제조방법 및 이의 응용). Korean Patent 10-2018434-0000 filed October 17, 2017 and issued August 29, 2019.
- (3) Chung, W.-J., Nisola, G.M., Torrejos, R.E.C., **Parohinog, K.J.**, Limjuco, L.A., Escobar, E.C., Cuevas, R.A.I. 2019. Membrane for metal ion adsorption, method for manufacturing thereof and application thereof (금속이온 흡착막, 이의 제조방법 및 이의 응용). Korean Patent 10-1987667-0000 filed September 27, 2017 and issued June 11, 2019.

## AWARDS

- (1) **Best Poster Presentation Award** (우수 포스터 발표상). Korean Institute of Chemical Engineers Fall 2015 Conference (한국화학공학회 2015년 가을 학술대회). KINTEX, Ilsan, South Korea. October 21-23, 2015.
- (2) **Silver Power of You Award**. QA Organization, Procter & Gamble Philippines Inc. January 2013.
- (3) **Philippine Institute of Chemical Engineers -Negros Occidental Chapter Most Outstanding Chemical Engineering Graduate**. University of St. La Salle. March 2010.

## PROFESSIONAL MEMBERSHIPS

- (1) Member, **Philippine Institute of Chemical Engineers**, 2010 – *Present*
- (2) Associate Member, **The Institution of Chemical Engineers**, 2015 – *Present*
- (3) Graduate Student Member, **Korean Institute of Chemical Engineers**, 2015 – *Present*
- (4) Graduate Student Member, **American Institute of Chemical Engineers**, 2016 – *Present*
- (5) Graduate Student Member, **Korean Society of Environmental Engineers**, 2018 - *Present*

CONFERENCE PRESENTATIONS
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- (1) **Parohinog, K.J.**, Nisola, G.M., Chung, W.-J. Thermo-Responsive Crown Ether Polymer Brushes Grafted on Carbon Nanotube as an Adsorbent for the Temperature Swing-Assisted Recovery of Palladium from Spent Automobile Catalyst Converter. 2021 Korean Society of Environmental Engineers Domestic Conference (2021 대한환경공학회 국내학술대회). Jeju Shinhwa World, Jeju, South Korea. November 3-5, 2021. (Oral).
- (2) **Parohinog, K.J.**, Nisola, G.M., Chung, W.-J. Thermoresponsive Crown Ether Polymer Brushes Grafted on Carbon Nanotube as Adsorbent for Selective Palladium Recovery from Spent Automobile Catalyst Converter. 2021 Korean Institute of Chemical Engineers Spring Conference (한국화학공학회 2021 년 봄 학술대회). BEXCO, Busan, South Korea. April 21-23, 2021. (Oral).
- (3) **Parohinog, K.J.**, Nisola, G.M., Chung, W.-J., Lee, S.-P. Design and Synthesis of Crown Ether-functionalized Magnetic Graphene Oxide as a Multi-Functional Adsorbent for Selective Metal Ion Recovery. International Environmental Engineering Conference 2019. BEXCO, Busan. December 10-13, 2019. (Oral).
- (4) **Parohinog, K.J.**, Nisola, G.M., Chung, W.-J., Lee, S.-P. Thermo-responsive Ionophore Polymer Brushes Grafted on Carbon Nanotubes as a Composite Adsorbent for Selective Pd Recovery from Spent Automobile Catalyst Converter. International Environmental Engineering Conference 2019. BEXCO, Busan. December 10-13, 2019. (Poster).
- (5) **Parohinog, K.J.**, Fissaha, H.T., Limjuco, L.A., Nisola, G.M., Chung, W.-J., Lee, S.-P. Thermo-Responsive Ionophore Polymer Brushes Grafted on Magnetic Graphene Oxide as a Dual-Functional Composite Adsorbent for Selective Lithium Ion Recovery from Seawater. American Institute of Chemical Engineers 2019 Annual Meeting. Hyatt Regency, Orlando, Florida. November 10-15, 2019. (Poster).
- (6) **Parohinog, K.J.**, Nisola, G.M., Chung, W.-J., Lee, S.P. Synthesis of crown ether decorated magnetic graphene oxide as a multi-functional adsorbent for selective lithium ion recovery. 1<sup>st</sup> International Symposium on Electronic Waste and End-of-Life Vehicles, ICC, Jeju, South Korea. May 19-22, 2019. (Poster).
- (7) **Parohinog, K.J.**, Lawagon, C.P., Nisola, G.M., Chung, W.J., Lee, S.P. Highly selective lithium recovery from brine using LNCM/Ag and LNMO/Ag battery system. 1<sup>st</sup> International Symposium on Electronic Waste and End-of-Life Vehicles. ICC, Jeju, South Korea. May 19-22, 2019. (Poster).
- (8) **Parohinog, K.J.**, Nisola, G.M., Chung, W.-J., Lee, S.P. Crown Ether-decorated Magnetic Graphene Oxide as a Composite Adsorbent for Selective Precious Metal Ion Recovery. 2018 Korean Society of Environmental Engineers Domestic Conference (2018 대한환경공학회 국내학술대회). Kim Dae Jung Convention Center, Gwangju, South Korea. November 14-16, 2018. (Oral).

- (9) **Parohinog, K.J.**, Nisola, G.M., Tekeste, G.G., Nigusse, M.D., Sio, J.E., Chung, W.J., Lee, S.P. Crown Ether-Decorated Phosphazene-Modified Magnetic Graphene Oxide as a Composite Adsorbent Material for Selective Lithium Ion Recovery from Seawater. 2018 Korean Institute of Chemical Engineers Fall Conference (한국화학공학회 2018년 가을 학술대회). EXCO, Daegu, South Korea. October 24-26, 2018. (Poster).
- (10) **Parohinog, K.J.**, Nisola, G.M., Lee, S.P., Chung, W.J., Torrejos, R.E.C. Highly selective separation of Pd<sup>2+</sup> and Pt<sup>4+</sup> using novel oxathia-crown ethers: Experimental and DFT complexation studies. 2018 Korean Institute of Chemical Engineers Fall Conference (한국화학공학회 2018년 가을 학술대회). EXCO, Daegu, South Korea. October 24-26, 2018. (Poster).
- (11) **Parohinog, K.J.**, Lee, S.P., Nisola, G.M., Chung, W.J. Crown Ether-Decorated Phosphazene-functionalized Magnetic Reduced Graphene Oxide as a Composite Adsorbent Material for Selective Lithium Ion Recovery from Seawater. 2018 Korean Institute of Chemical Engineers Spring Conference (한국화학공학회 2018년 봄 학술대회). Changwon Convention Center, Changwon, South Korea. April 25-27, 2018. (Poster).
- (12) **Parohinog, K.J.**, Nisola, G.M., Chung, W.J. Ionophore-Decorated Phosphazene-Functionalized Magnetic Graphene Oxide as a Composite Adsorbent Material for Selective Lithium Ion Recovery (*Carbon Nanomaterials Graduate Student Award Session*). American Institute of Chemical Engineers 2017 Annual Meeting. Minneapolis Convention Center, Minnesota, USA. October 29 – November 3, 2017. (Oral).
- (13) **Parohinog, K.J.**, Nisola, G.M., Chung, W.J. Ionophore-Decorated Phosphazene-Functionalized Magnetic Graphene Oxide as a Composite Adsorbent Material for Selective Lithium Ion Recovery. American Institute of Chemical Engineers 2017 Annual Meeting. Minneapolis Convention Center, Minnesota, USA. October 29 – November 3, 2017. (Oral).
- (14) **Parohinog, K.J.**, Nisola, G.M., Chung, W.J. Ionophore-Decorated Magnetic Graphene Oxide as a Composite Adsorbent Material for Heavy Metal Ion Sequestration. American Institute of Chemical Engineers 2017 Annual Meeting. Minneapolis Convention Center, Minnesota, USA. October 29 – November 3, 2017. (Poster).
- (15) **Parohinog, K.J.**, Nisola, G.M., Lawagon, C.P., Limjuco, L.A., Bendoy, A.P., Albarico, J.S., Gebreegzabher, H.Z., Tekle, H.F., Chung, W.J. Clicking Crown Ether with Magnetic Graphene Oxide as a Composite Adsorbent Material for Selective Lithium Recovery from Seawater. 2017 Korean Institute of Chemical Engineers Spring Conference (한국화학공학회 2017년 봄 학술대회). ICC, Jeju, South Korea. April 26-28, 2017. (Poster).
- (16) **Parohinog, K.J.**, Nisola, G.M., Lawagon, C.P., Limjuco, L.A., Bendoy, A.P., Albarico, J.S., Gebreegzabher, H.Z., Tekle, H.F., Chung, W.J. Crown Ether-Decorated Magnetic Reduced Graphene Oxide as a Composite Adsorbent for Lithium Ion Recovery from Seawater. 2016 Korean Institute of Chemical Engineers Fall Conference

(한국화학공학회 2016 년 가을 학술대회). Daejeon Convention Center, Daejeon, South Korea. October 19-21, 2016. (Oral).

- (17) **Parohinog, K.J.**, Nisola, G.M., Lawagon, C.P., Galanido, R.J., Lee, S.P., Hern, K., Chung, W.J. Lithium Adsorption and Selectivity Studies using Crown Ether-functionalized Magnetic Graphene Oxide. 2016 Korean Institute of Chemical Engineers Spring Conference (한국화학공학회 2016 년 봄 학술대회). BEXCO, Busan, South Korea. April 27-29, 2016. (Poster).
- (18) **Parohinog, K.J.**, Nisola, G.M., Lawagon, C.P., Galanido, R.J., Torrejos, R.E.C., Limjuco, L.A., Hern, K., Chung, W.J. Clicking Crown Ether-decorated Graphene Oxide and Magnetite Together: A Composite Adsorbent for Lithium Ion Recovery. 2015 Korean Institute of Chemical Engineers Fall Conference (한국화학공학회 2015 년 가을 학술대회). KINTEX, Ilsan, South Korea. October 21-23, 2015. (Poster).
- (19) **Parohinog, K.J.**, Nisola, G.M., Lawagon, C.P., Galanido, R.J., Torrejos, R.E.C., Limjuco, L.A., Lee, S.P., Chung, W.J. Clicking Magnetite and Crown Ether-decorated Graphene Oxide together: a composite adsorbent for the Lithium Ion recovery. IUPAC-2015. BEXCO, Busan, South Korea. August 7-13, 2015. (Poster)