

**Name:** Dr. Michael Ruby Raj (M. Ruby Raj)

**Current Affiliation:** Research Assistant Professor (International Faculty Member), School of Chemical Engineering, **Yeungnam University**, Gyeongsan-Si, Republic of Korea (**2021-till date**)

**Ph.D.:** Department of Chemistry, National Institute of Technology, Tiruchirappalli-620015, INDIA (**2013**)

**Post – Docs /Principal Investigator:** (i) *Post-Doctoral Research Fellow*, School of Chemical Engineering, **Yeungnam University, Republic of Korea (2019-2021)**  
(ii) *FONDECYT-Post-Doctoral Researcher and Principal Investigator*, Department of Materials Engineering, **University of Concepción, Concepción, Chile (2016-2018)**  
(iii) *Post-Doctoral Research Fellow*, Department of Chemical Engineering, **Pohang University of Science and Technology (POSTECH), Republic of Korea (2013-2016)**

**Research Interests:** (i) Metal/Covalent Organic Frameworks (MOFs/COFs) and Perylenediimide-based Conjugated Polyimides for rechargeable Alkali-metal-ion batteries.  
(ii) COFs@S and COFs@Se cathode materials for Aluminium-Sulfur (Al-S) and Aluminium-selenium (Al-Se) batteries.

Journal articles > 40, h-index –20 [Scopus]; Citations > 855, Patent: 1, Book chapters: 2.

#### **Brief CV:**

**Dr. Michael Ruby Raj** is currently working as a Research Assistant Professor at School of Chemical Engineering, Yeungnam University (Republic of Korea) with a Ph.D. in Chemistry from National Institute of Technology, Tiruchirappalli (2013), earned through research at Semiconducting Polymers for Organic Solar Cells in Department of Chemistry. With over 10 years of expertise in semiconducting/conjugated organic functional materials for energy conversion and storage applications. He is a recipient of prestigious FONDECYT-post-doctoral fellowship (University of Concepción, CHILE) and completed his Interdisciplinary research on semiconducting/conjugated polymers for polymer/perovskite solar cells at Pohang University of Science and Technology (POSTECH), Republic of Korea.

**Dr. Ruby Raj** has authored ~40 research publications and 2 books with a citation index of over 855 and an h-index of 20. He is an inventor of 1 awarded patent (1 Korea). **Dr. Ruby Raj** has been involving in the peer-reviewer activity in the several journals, including Advanced Functional Materials (Wiley), ACS Applied Materials & Interface (ACS), Energy Storage Materials (Elsevier), ACS Sustainable Chemistry & Engineering (ACS), Advanced Energy Materials (Wiley), Angewandte Chemie International Edition (Wiley), Electrochimica Acta (Elsevier), Journal of Energy Storage (Elsevier), Energy Technology (Wiley), and Chemical Engineering Journal (Elsevier). His current research spans on the advanced organic functional materials and their composites for rechargeable alkali-metal-ion batteries, including Al-S and Al-Se batteries. He has also strong proficiency in technical writing, including grant/funding proposals in energy conversion and storage domains

#### **Selected Publications:**

1. **M. Ruby Raj**, V. Ramkumar, Inseo Cho, and Gibaek Lee\*, *Multisite  $AlCl_2^+$  Coordination in Flower-like Zn-PTC Superstructures for High-Energy and Long-Life Aluminum-Organic Batteries*, ACS Appl. Mater. Interfaces, 17 (**2025**) 63399–63419.
2. T. Selvamani, Y. Jeong, **M. Ruby Raj\*** and Gibaek Lee\*, *Ultrasonochemical-Assisted Synthesis of Defect-Rich Dual-Metal Doped  $TiO_2$  Nanomaterial as a High-Performance Cathode for Aqueous Zinc-Ion Batteries*, ACS Appl. Mater. Interfaces, 17 (**2025**) 59247–59265.
3. **M. Ruby Raj**, D.-K. Son, Y. Lee, H. Kim, Y. Jeong and Gibaek Lee\*, *Coordination of Monovalent  $AlCl_2^+$  by Redox-Active Carbonyl Groups in Perylene Polyimide for Aluminum Batteries Using Urea-Based Ionic Liquids*, ACS Appl. Energy Mater. 8 (**2025**) 7984–8003.

4. **M. Ruby Raj\***, Karim Zaghib\* and Gibaek Lee\*, *Advanced Aqueous Electrolytes for Aluminum-Ion Batteries: Challenges and Opportunities*, Energy Storage Materials, 78 (2025) 104211.
5. V. S. Murugesan\*, **M. Ruby Raj\***, H. B. Lee, N. Kumar, *Fabrication of High-Efficiency Perovskite Solar Cells using Benzodithiophene-Based Random Copolymeric Hole Transport Material*, Electrochimica Acta, 509 (2024) 145315.