Hyeong-Bin Jeong

M.S. Student in Mechanical Engineering
at Pusan National University
& Pusan Clean Energy Research Institute

Combustion & Pyrolysis Research
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Education

- Pusan National University
  M.S. in Mechanical Engineering · Major in Energy Systems Engineering
  Mar. 2025 – Feb. 2027 (Expected)

- Pusan National University
  B.S. in Mechanical Engineering
  Mar. 2019 – Feb. 2025

Research Experience

- Energy Conversion Systems Laboratory, PCERI, Pusan National University
  M.S. Student Researcher | Mar. 2025 – Present
  - Experimental investigation of COG/NH_3 and H_2/NH_3 co-combustion
  - Flame visualization and exhaust gas analysis under varying fuel and oxidizer conditions
  - 1-D chemical kinetic analysis of flame structure and NO_x formation pathways

- Energy Conversion Systems Laboratory, PCERI, Pusan National University
  Undergraduate Research Intern | Mar. 2024 – Feb. 2025
  - Conducted high-pressure pyrolysis experiments of waste plastics
  - Analyzed product gases using gas chromatography (GC)
  - Investigated pressure and catalyst effects on hydrogen production

Publications

• P3

Experimental and Numerical Investigation of Combustion Characteristics and NO Formation in Oxygen-Enriched COG/NH_3 Jet Flames

Hyeong-Bin Jeong, Min-Jong Ku, Kyeong-Ho Kim, Hyeong-Bin Moon, Seung-Mo Kim, Byoung-Hwa Lee, Chung-Hwan Jeon

I*nternational Journal of Hydrogen Energy* · Under Review · Submitted Jul. 31, 2026

• P2

A strategy for low-carbon steelmaking: Combustion characteristics analysis of steel off-gases and ammonia co-firing

Kyeong-Ho Kim, Min-Jong Ku, **Hyeong-Bin Jeong**, Joonwoo Kweon, Byoung-Hwa Lee, Chung-Hwan Jeon

Fuel, Vol. 428, Part E, Article 140573, 2027 · **Paper** ↗

• P1

Enhanced hydrogen production from polypropylene via NiO/Zeolite Y catalyzed high-pressure pyrolysis: Effects of pressure and methanation reactions

Hyeong-Bin Moon, **Hyeong-Bin Jeong**, Jae-Hun Yang, Ajayan Vinu, Byoung-Hwa Lee, Chung-Hwan Jeon

Journal of the Energy Institute, Vol. 121, Article 102162, 2025 · **Paper** ↗

Conference Presentations

• **C3**

Effect of Hydrogen Addition on Flame Structure and NO_x Emission Characteristics in Laminar Ammonia Diffusion Flames

Korean Combustion Society Conference · May 2026 · **Oral Presentation**

• **C2**

Experimental and Numerical Study on the Effect of COG/NH_3 Co-Combustion in a Laminar Diffusion Burner

Korean Combustion Society Conference · Nov. 2025 · **Oral Presentation**

• **C1**

High-Pressure Catalytic Pyrolysis of Polypropylene: Enhanced Hydrogen Production

Korean Energy & Climate Change Conference · May 2025 · **Oral Presentation**

International Research Experience

- **Osaka University, Japan**
  Combustion Engineering Laboratory
  · *Visiting Research Student* **| Jan. 2026**
  - Conducted experimental investigation of H_2/NH_3 counterflow diffusion flames
  - Analyzed flame structure and radical characteristics
  - **University of Newcastle, Australia**
- *Global Innovative Centre for Advanced Nanomaterials (GICAN)*
  · *Visiting Research Student* **| Jul.–Aug. 2025**
  - Conducted catalyst characterization for waste-plastic pyrolysis research
  - Performed material characterization using BET, XRD, and SEM–EDS

Technical Skills

- **Experimental & Diagnostics**

FT-IR · Gas Chromatography (GC) · High-Pressure TGA (HP-TGA) · High-Speed / UV Cameras

- **Material Characterization**

XRD · SEM–EDS · BET

- **Numerical & Simulation**

CHEMKIN-PRO — 1-D Flame Simulation, Reaction Pathway & Sensitivity Analysis
ANSYS Fluent — Reactive Flow & Combustion Simulation

- **Engineering & Design**

PTC Creo — 3-D Mechanical Modeling & Component Design