

Tomohiro Mochizuki

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Experience

AUG 2026 – PRESENT

Graduate Research Assistant | *Purdue University*, West Lafayette, IN, US

- Conducting research on advanced battery technologies under Prof. Partha P. Mukherjee at the Energy and Transport Sciences Laboratory (ETSL).

APR 2025 – MAR 2026

Battery Materials Engineer | *QuantumScape*, San Jose, CA, US

- Developed and characterized novel solid-electrolyte materials for anode-free all-solid-state batteries using XRD, Raman, FT-IR, DSC, and EIS.
- Synthesized and handled air-sensitive electrolyte materials under inert-atmosphere conditions and investigated relationships among composition, structure, thermal behavior, and ionic conductivity.

APR 2020 – OCT 2024

Cell Development & Production Engineer | *Toshiba*, Yokohama, Japan

- Identified three key design factors affecting self-discharge in 5 μm -class separators through multivariate analysis and optimized the design to reduce self-discharge by >90%.
- Proposed an electrode design modification based on statistical analysis, projected to reduce the defect rate by 3 percentage points, leading to approval of a \$1M equipment investment.

SEP 2023 – NOV 2023

International Assignment - TDS Lithium-Ion Battery Gujarat Private Limited (TDSG), Gujarat, India

- Supported the launch of an electrode manufacturing line for hybrid-vehicle lithium-ion batteries in India.

Education

Purdue University — West Lafayette, IN

Ph.D., Mechanical Engineering | Aug 2026 – Present

Advisor: Prof. Partha P. Mukherjee

Tohoku University — Sendai, Japan

M.S., Environmental Studies, GPA: 4.00/4.00 | Apr 2018 – Mar 2020

Advisor: Prof. Shin-ichi Orimo

- Developed YMgNi₄-based hydrogen-storage alloys and correlated crystal structure with hydrogen-storage properties using XRD analysis.

Tohoku University — Sendai, Japan

B.S., Materials Science and Engineering, GPA: 3.45/4.00 | Apr 2014 – Mar 2018

Advisor: Prof. Toshimasa Wadayama

- Developed an in-situ electrochemical mass-spectrometry method and analyzed CO₂ reduction products on Au catalysts.

Skills

Battery & Materials

Slurry processing, Ball milling, Electrode fabrication, Die coating, Electrospinning, Glovebox handling

Materials characterization

XRD/Rietveld refinement, SEM-EDS, Raman spectroscopy, ATR FTIR, DSC, Karl Fischer titration

Electrochemistry

EIS, CV, GCD, DC-IR, AC-IR, Leakage-current testing

Data Analysis & Statistics

Python, JMP, MATLAB, Spotfire, Power BI, Design of Experiments (DOE), Multivariate analysis

Scientific Software

Origin, TOPAS, RIETAN-FP, VESTA, ImageJ

Certifications

- Microsoft Power BI Data Analyst Professional Certificate, Jan 2025
- Japan Statistical Society Certificate Grade Pre-1, Jul 2024
- Quality Management and Quality Control Examination Grade Pre-1, Mar 2023

Publications

- Toyoto Sato, **Tomohiro Mochizuki**, *et al* "Crystal Structural Investigations for Understanding the Hydrogen Storage Properties of YMgNi₄-Based Alloys", ACS Omega 2020, 5, 48, 31192–31198
- Hiroto Tsurumaki, **Tomohiro Mochizuki**, *et al* "Rotating Disk Electrode – Online Electrochemical Mass Spectrometry for Oxygen Reduction Reaction on Pt Electrode Surfaces", ECS Transactions 2018, 86, 447
- Naoto Todoroki, Hiroto Tsurumaki, Hiroki Tei, **Tomohiro Mochizuki**, *et al* "Online Electrochemical Mass Spectrometry Combined with the Rotating Disk Electrode Method for Direct Observations of Potential-Dependent Molecular Behaviors in the Electrode Surface Vicinity", Journal of The Electrochemical Society 2020, 167, 106503