

S1-2 Carbon-Neutral Technologies: Batteries, Fuel Cells, Electrolyzers, and Related Devices

SHORT DESCRIPTION:

To achieve carbon neutrality, electrochemical devices such as fuel cells with high energy-conversion efficiency, rechargeable batteries that manage power output by storing electricity, and electrolysis for hydrogen production represent technologies that can significantly reduce CO₂ emissions. Research into the functional ceramic materials that make these technologies possible will be discussed in terms of both fundamentals, such as creation of new materials and clarification of reaction mechanisms, and applications, such as development of manufacturing processes and devices.

SESSION TOPICS:

- Batteries: Li-ion battery, solid-state battery, and next-generation batteries
- Solid oxide fuel cells and solid oxide electrolysis cells (SOFC/SOEC)
- Protonic ceramic fuel cell and protonic ceramic electrolysis cell (PCFC/PCEC)
- Electrochemical ceramic reactors

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