

Division of Environmental Studies

Department of Environment Systems

| Laboratory | Faculty | Introduction of research activities and laboratory | Key words | Projects or activities summer program students can participate |
|---|---|--|---|--|
| Environmental Chemical Energy Engineering Laboratory (Otomo Laboratory) | Assoc.Prof. Junichiro OTOMO | <p>Development of environmental-benign energy devices and systems is a crucial issue in terms of energy saving and reduction of CO₂ emission. The research in Otomo laboratory focuses on electrochemical reaction, catalytic reaction and ionic conduction in solid electrolytes with the objective of integrating the elemental technologies into new chemical energy conversion devices and systems such as fuel cells, hydrogen production and energy storage systems. The integration of physicochemical phenomena with different scales is necessary to construct novel energy devices and systems. Thus, we are investigating the physicochemical (or electrochemical) phenomena through the perspective in molecular-scale, mesoscopic scale and macroscopic scale to solve some energy problems.</p> | <ol style="list-style-type: none"> 1) Chemical looping 2) Eversible fuel cell 3) Hydrogen 4) Energy storage 5) Technology assessment | <p>Hydrogen production and energy storage systems are key technologies in terms of future energy systems combined with renewable energy. Chemical-looping (CL) and reversible fuel cell (r-FC) technologies are efficient energy conversion systems, and they attract attention as next generation energy supply and storage systems. To advance the systems, their technology assessments are required as well as experimental studies. In this project, the assessment of environmental impact and relevant experiment for CL or r-FC system will be investigated based on physicochemical properties of component materials and reactions with relevant experiments of CL and r-FC.</p> |