Environment and chemical Engineering Lab. Horikoshi Lab research themes (2025-2026)











Tire

H₂ energy

Mechanochemical

Chemistry and Beauty

- Sustainable synthesis of pharmaceutical/fragrances
- Energy-saving electrochemistry using EM waves
- GC synthesis of nature-friendly Microwave-responsive adhesives
 Innovative microwave catalyst technology
 Next-generation beauty technology
 Elucidation of the safety of EM waves and cosmetics

Environment and Energy

- Circular economy tire
 manufacturing and 3R technology
- Creating new value from e-waste
- Future of environmentally friendly adhesive technology
- Novel H₂ supply chain technology using microwave chemistry
 GC-based synthesis using mechanochemical methods

Microwave and Photo energy utilization and future technologies

- Climate change adaptation for plants and fish using electromagnetic stimulation methods
- Elucidation of highly efficient breeding methods in poor environments
- Microwave-responsive enzymes/bacteria

Plants

Scientific systematization of

- Innovation in next-generation AI heating processes
- Development of AI theories of energy conversion
- Development and implementation of intelligent cooking machines
- Machine learning and AI process design in food science

microwave technology for food and frozen foods Biology and Food science

Data Science



Fish farming Enzymes/Bacteria IG Cooking AI heating Machine

A future realized through persistent research