

國立中央大學 National Central University

環境工程研究所 Graduate Institute of Environmental Engineering

Green Technology and Resource Recovery Laboratory Kung-Yuh Chiang (江康鈺)



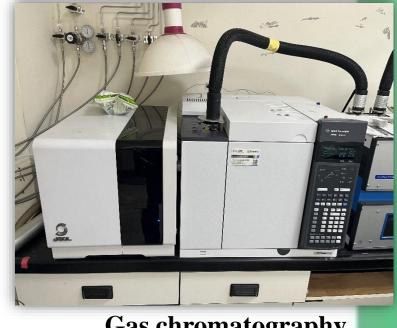
Professor

Establishing a recycling-oriented society toward sustainability will, in many cases, require novel waste treatment and recycling technologies to alter their practices. Due to the progress in development of new recyclable materials, green design, and energy conversion technologies, the recycling of organic and/or inorganic wastes has become the focus and direction of this lab, applying processes such as composting, combustion, pyrolysis, gasification, sintering and melting techniques. Other that the important and highly developed area such as studies on urban mass and energy flow, development of environmental friendly materials, as well as the carbon dioxide capture by accelerated carbonation technology. This lab also emphasize on development of energy-saving process using autoclaving (hydrothermal reaction) and environment-friendly technologies.

- Research highlight

- ➤ Waste-to-energy
 - Waste-to-syngas technology (gasification)
 - Waste-to-biooil technology (pyrolysis)





- Enhanced energy conversion by innovative conversion techniques
- Syngas clean-up by a innovative hot gas cleaning system
- Syngas clean-up by a innovative mixed matrix membranes (MMMs)

Waste-to-material

- Green building material produced from nonhazardous sludge/ wastes
- Green lightweight material produced from wastes
- Innovative antibacterial lightweight material development
- Agricultural residues derived valuable products: inorganic filler on mixed matrix membranes (MMMs), biochar for soil metal adsorption
- Extraction of Cellulose nanocrystal (CNC) from cotton cloth waste
- > CO, capture & MWSI Fly Ash Stabilization
 - CO₂ capture by accelerated carbonation technique
 - CO₂ capture by CNC-Silica hybrid aerogel
 - MSWI fly ash stabilization and heavy metal partitioning
 - MSWI fly ash detoxification and resourcification by thermite
- > Innovative catalyst prepartion

Thermogravimetric analysis



Elemental Analyzer



Ion Chromatography

Gas chromatography



Fourier-transform infrared spectroscopy



BET



- Life cycle assessment (LCA)
- Environmental impact assessment (EIA)
- Recent research
- Morphological evolution of a 3D flower-like Hierarchical Co(OH)₂ /Ni(OH)₂ and CoLDH on V_2O_5 for highly stable energy storage Supercapacitors
- Synthesis and CO₂ adsorption efficiency of polyethyleneimine-modified cellulose \bullet anocrystal/ silica hybrid aeroge
- Development of biogenic filler of Pebax mixed matrix membranes for CO₂ separation
- Optimum eco-friendly extraction of terephthalic acid (H2BDC) derived from PET waste \bullet using the response surface methodology