Open your mind. LUT.
Lappeenranta University of Technology
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Laboratory of Green Chemistry
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Laboratory of Green Chemistry has specialized in analytics and water and wastewater purification techniques:

- advanced water treatment
- environmental analytics and monitoring

› Facts

- Head of the laboratory Prof. Mika Sillanpää
- international staff ca. 30 (2013)
- turnover ca. 3,3 M€ (2013)

LGC conducts research work in finding new solutions to prevent and decrease environmental pollution and developing novel materials and processes for water purification applications.
Research areas

- Adsorption
- Advanced Oxidation Processes (AOPs)
- Electrochemical treatment
- Analytics and online monitoring
Adsorption

- **Ongoing research**
  - Nano- and microcellulose based materials for water treatment applications (NaCeWa)
  - Low-cost adsorbents for the treatment of mining wastewaters
  - Hydrothermally carbonized biomass for (WetPyro)
  - Recovery of nutrients by adsorption

- **Previous research**
  - Nanosorbents for heavy metal extraction from low concentrations (MONIWATER)
  - Nanosorbents produced by biosynthesis from natural products and indigenous minerals
  - Preparation of activated carbon from natural products
  - Functionalized adsorbents for heavy metal removal (UMASYS)
Advanced Oxidation Processes (AOPs)

• **Ongoing research**
  • Nanotechnology in advanced oxidation process; a green process for the treatment of toxic organics present in water and wastewater
  • LED-based photocatalysis for water treatment
  • Disinfection by UV-LED radiation
  • Hybrid membrane process for water treatment
  • Sonoelectrocatalysis in water treatment

• **Previous research**
  • Catalytic Degradation of Persistent Organic Pollutants
  • Sonochemically-assisted Electrochemical Treatment
  • Nanolyst – Nanostructured materials for Catalytic Oxidation
  • Novel Materials and Systems for Degradation of Organic Pollutants
  • AOP’s in Treatment of Pulp and Paper Mill Wastewaters
  • UV LED and ALD-coated Photocatalysts in Water Treatment
  • Novel micro- and nanostructured semiconductors and their photocatalytic properties
Electrochemical technologies

• Ongoing research
  • Electrochemical oxidation
  • Electrochemical coagulation
  • Electrokinetic remediation
  • Electro-Fenton process
Analytics and online monitoring

- **Ongoing research**
  - IMS Quantitative Analysis
  - IMS and Sample Introduction Methods
  - Carbonized cellulose films in sensor applications
  - Protection of Waters in Egypt
  - Water quality of the "Water Tower of Asia" – Tibetan Plateau
  - Environmental organics

- **Previous research**
  - Developing alternative, nonradioactive ionization methods for IMS
  - Quantitative analysis additives called dopants
  - Thermal evaporation of ionic liquids and determination by IMS
  - Effect of humidity in IMS have been previously studied.
  - Ion sensing on junction
  - DNA sensors in environmental analysis
Laboratory equipments

- Total organic carbon analyzer
- Capillary Electrophoresis System
- FTIR
- Gas Chromatography system
- High-performance liquid chromatography
- ICP-OE Spectrometer
- Inert mass selective detector
- Surface Area and Pore Size Analyzer
- Viscotester
- UV/Vis Spectrometer
- Zetasizer