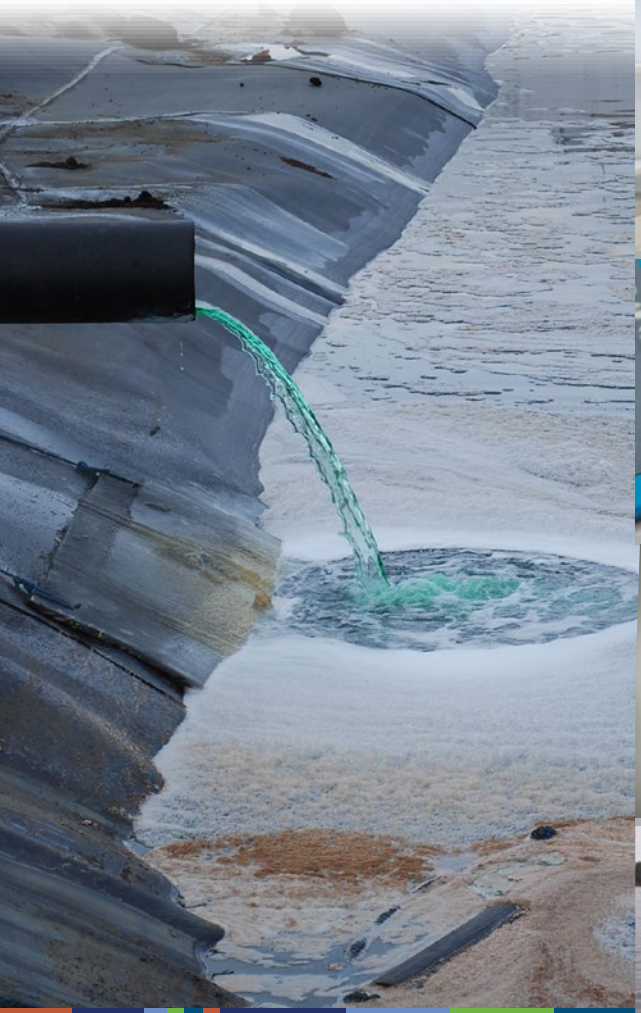
CEMIS

Centre for Measurement and Information Systems

Solutions for water management



www.cemis.fi

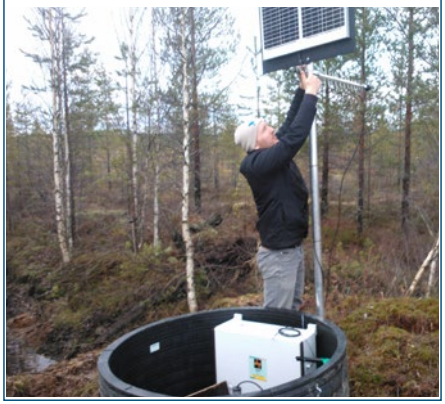
Technology and know-how for water management

CEMIS aims to help industrial and municipal water users through innovative on-line measurement technologies and novel water treatment systems. Our ability to create novel technology solutions by combining the expertise of the various research units at CEMIS is a competitive advantage.

CEMIS' water monitoring and treatment technologies and services

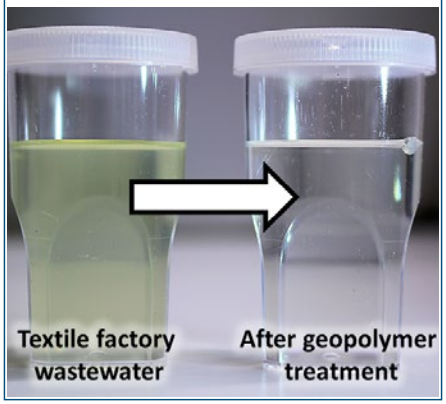
University of Oulu – Measurement Technology unit MITY

- Development of sensors based on biosensing, electrochemistry, digital imaging and optical spectroscopy
- Online monitoring devices for harmful components in process and waste water (e.g. toxic metals and sulfates)
- Expert services in analytical chemistry and bioanalysis services



KAMK – Kajaani University of Applied Sciences

- Technology development: geopolymer-based adsor bent and related equiment
- Education: Bachelor level education in mechanical and mining engineering as well as in information systems
- Testing and analysis services for industry
- Commercialisation services and business development



VTT Technical Research Centre of Finland

- National Metrology Institute's calibration and development services of water flow

Reliable online measurements for demanding conditions

MITY develops reliable on-line measurement systems for automatic, real-time and continuous monitoring of process parameters and environmental pollutants such as toxic metals, sulphate, phosphate, chlorides, and several other cations and anions. CEMIS technologies are field tested in harsh operational conditions.

Key technologies
Tailor-made sensors and complete analysers based on biosensing, electrochemistry, digital imaging and optical spectroscopy.

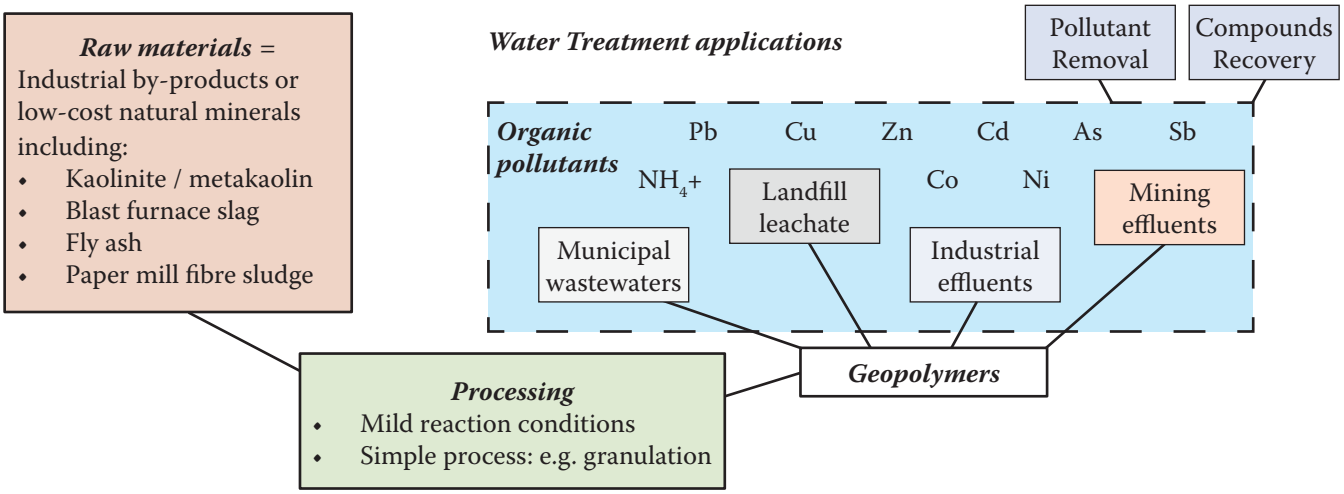
1. Online automatic measurement system for toxic metals (e.g. Cu, Pb, Ni, Hg...) µg/L (ppb) level
2. Multiparameter measurement solution enabling the determination of concentrations of several compounds including trace metals, phoshorus, nitrogen and sulfates in real-time and continuous mode
3. Online Capillar Electrophoresis analyser for the detection of several anions and cations (e.g. SO4, SO3, Cl, Na, Ca, Mg)
4. Mobile aerial and floating measurement platforms
5. Well-equipped laboratories and experienced staff for analytical chemistry and bioanalysis service

Geopolymer-based adsorbents and related equipment

KAMK has specialised in the development of adsorbent-based water treatment technologies. The adsorbents are manufactured using a geopolymerisation technique using industrial by-products or natural minerals as a raw material. The adsorbents are used for the removal of harmful elements and compounds as well as the recovery of valuable elements and compounds from industrial and natural waters.

In addition, KAMK provides testing and analyses services for new material development and characterisation.

Geopolymer adsorbents



CEMIS Business Development

CEMIS Business Development team (CBD) helps research units of CEMIS, partner companies and other customers in:

- *technology commercialisation (from the lab to the market)*
- *technology business development*
- *market and business analyses*
- *industry-driven R&D project planning*
- *service business development*
- *international partnering*
- *start-up and SME growth consultation*

VTT MIKES Metrology

VTT MIKES Metrology maintains and develops the national measurement system.

VTT's unit at CEMIS offers:

- *National Metrology Institute's calibration services for water flow, force, torque and mass*
- *Development of reliability and precision of measurement and testing devices*

Water flow, other liquids and suspensions

- 750 l/s Ø = 500 mm, l = 65 m, water
- 100 l/s Ø = 100 mm, l = 25 m, water
- 250 l/s Ø = 200 mm, h = 20 m, water
- 80 l/s Ø = 200 mm, l = 30 m, suspensions, consistency < 10 %

Services for companies

- Research and development services
- Expert services
- Training in measurement system, measurement uncertainty and traceability

Works together!

CEMIS - the Centre for Measurement and Information Systems *is a contract-based joint centre of the University of Oulu, Kajaani University of Applied Sciences, VTT Technical Research Centre of Finland, the University of Jyväskylä, and the Finnish IT Centre for Science CSC. CEMIS specialises in research and training in the field of measurement and information systems.*

CEMIS is a community of 110 measurement and information system experts combined with excellent research and training environments. The combined annual funding of the various units is approximately € 10 million.

CEMIS' Water Expertise

- Geopolymer-based adsorbents and equipment
- Online sensors and analysers for automatic, real-time and continuous monitoring of water quality
- Flow meter calibration and testing (National measurement standard)
- International technology business development

We are a desired R&D-partner within the international water community. With the support of our committed partners, we will create leading experts, new technology and new business operations in an innovative and international environment.

CEMIS

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