CEMIS Solutions - Water Treatment

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

CEMIS member Kajaani University of Applied Science (KAMK) have developed novel and cost-efficient solutions for the removal of contaminants from water by adsorption. The technique can be applied to process water, mine effluent, and the production of potable water.

The adsorbents by KAMK are based on industrial sidestreams and therefore highly cost-efficient in the treatment of large quantities of water. For the preparation of the adsorbents, the materials are treated with alkaline medium or heat activated. Additonally, the adsorbents can be doped with metal ions and auxilliar materials to improve the selectivity towards the contaminants or to react in a tailored way depending on the customer's water matrix.

CEMIS offering for mining companies and organizations:

Arsenic removal	Phosphate removal and recovery	Ammonium removal and recovery	Cobalt removal and recovery	Heavy metal removal

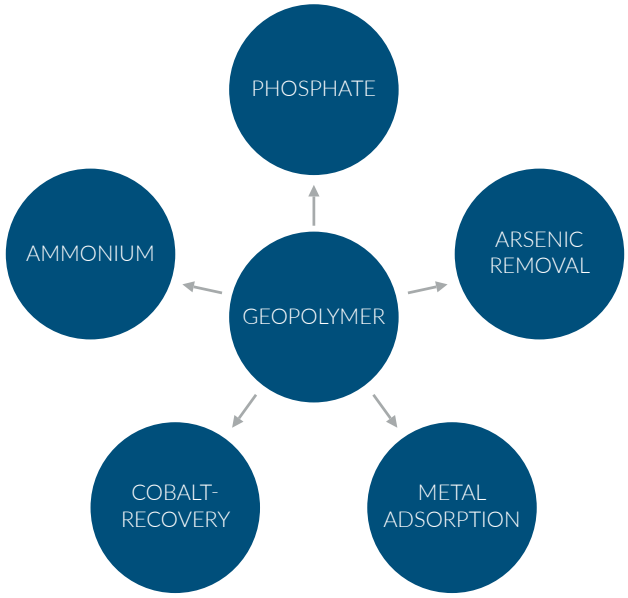
Benefits of Geopolymer applications:

- The adsorbents can be delivered as high-strength granules for passive structures, e.g. for ammonium and contaminant removal from mine drainage, or as powders for active feed.
- Metal removal for membrane conditioning to increase lifespan of membrane and RO-plant capacity.
- Removal of contaminant from process water or from eluent.

CEMIS achievements:

> 30	> 20	> 130	> 200	53	6
OVER 30 SPIN-OFF COMPANIES	OVER 20 COMMERCIAL INVENTIONS	OVER 130 REFEREED SCIENTIFIC PUBLICATIONS	OVER 200 CONFERENCE OR PROFESSIONAL PUBLICATIONS	53 MASTER DEGREE THESES	6 DOCTORAL THESES

CEMIS has water treatment solutions for:



We are able to remove the following metals:

Ni Co Pb Cr Cd Zn Al
Cu Fe Mn P U As

Phosphate removal and recovery

The phosphate removal can be done in 100% yield by treatment with geopolymers. The solutions is possible for the treatment of eutrophicated lakes and process waters.

Ammonium removal and recovery

Ammonium removal by geopolymers is cost efficient and effective. Removal rate can be up to 90%. The ammonium can be recovered and re-used as fertilizer.

Cobalt removal and recovery

Cobalt can be removed by adsorption from wastewater. The adsorbent can be treated to recover the cobalt highly selectively as cobalt sulfide concentrate in high yield.


COBALT

Arsenic removal

The geopolymer based arsenic removal is based on the simultaneous sorption of arsenic to the adsorbent and surface precipitation of highly insoluble iron and calcium arsenate species. The adsorbent sludge is inert waste (ISO 12457-3 test) and European directive (2003/33/EC) making it possible to place in normal landfill or store in tailing ponds.

For more information contact:

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CEMIS employs around 100 measurement and information system experts. The centre's annual funding is over € 10 million.

CEMIS offer a wide array of services to companies and research institutions. CEMIS services include research and development services, analysis and testing services, device development services as well as business development services.

KAMK • University of Applied Sciences
UNIVERSITY OF OULU
VTT

The strategic focus areas of CEMIS are:

ON-LINE MEASUREMENTS FOR CLEANTECH	SPORTS, WELLBEING AND HEALTHCARE MEASUREMENTS	INTERNATIONAL TECHNOLOGY BUSINESS DEVELOPMENT

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