

IBZ-Salzchemie GmbH & Co. KG

Your partner for mineral processing and technology development



Contract research for mineral processing and the development of special construction materials.

- Leaching, Flotation, Evaporation, Crystallization, Liquid-Liquid extraction, Ion Exchange

We serve the mineral industry for more than 20 years!



IBZ-Freiberg: Main working fields



- **Contract research**
 - Technologies for mineral processing, solution mining.
 - Salt recovery and processing.
 - Extraction of minor constituents from brines.
 - Geotechnical technologies for soil stabilization and immobilization of pollutants.
 - Development of backfill materials / backfill strategies.
 - Realization of in-house testing as well as pilot plant testing in the customers facilities.
 - Development of construction materials.
- Development and testing of chemicals for the prevention of gypsum and CaCO_3 scale formation
- Production of nanomaterials for stone, mortar and plaster conservation.

Mineral Processing



- **Separation processes**

- Flotation
- Evaporation
- Crystallization
- Dissolution kinetics for solution mining
- Leaching (conventional and by using of ionic liquids)
- Liquid-liquid extraction
- Solid - Liquid - Separation (Sedimentation, Filtration etc.)

- **Water treatment by**

- Precipitation
- Evaporation
- Ion exchange / Membrane technologies

Evaporation / Crystallization / Precipitation

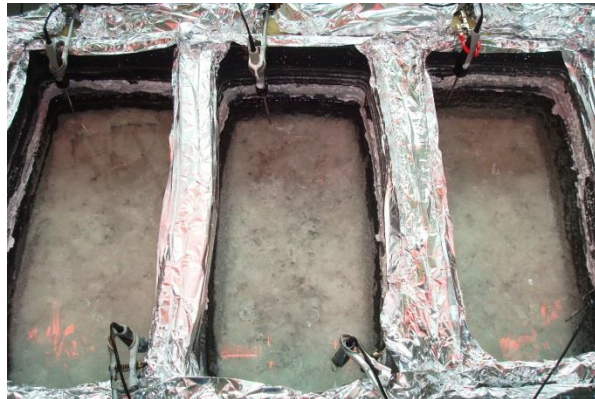
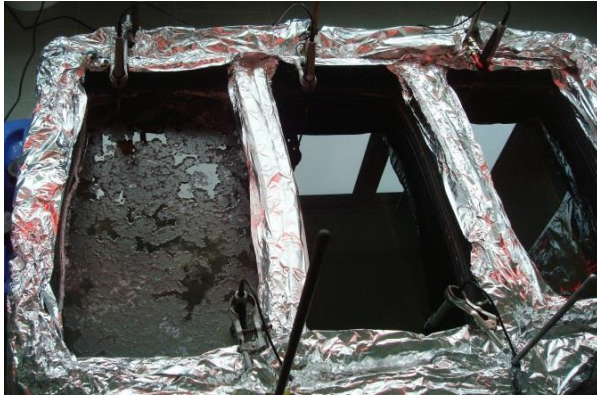
- Characterization of crystal growth.
- Continuous / batch crystallization, precipitation.
- Crystallization by thermal gradients and / or evaporation.
- Balancing of crystallization processes.



Froth Flotation



Solar evaporation



- Determination of crystallization paths.
- Balancing of the evaporation process.
- Characterization of mineral conversions.
- Modelling of evaporation processes.
- Development of heat and mass balances.

Scale prevention / scale removal



- Protection of heat exchangers, pipes, water treatment systems against the formation of sparingly soluble precipitates such as CaCO_3 , MgCO_3 , CaSO_4 / gypsum, BaSO_4 , SrSO_4 by
 - Water conditioning,
 - Addition of scale inhibitors (phosphonates, acrylates, etc.),
 - Selective removal of constituents (e.g. ion exchange),
 - Addition of seed crystals.
- Dissolution of formed scale by
 - Addition of acids / alkaline solutions,
 - Treatment with complex forming agents.

Chemistry for Geotechnology

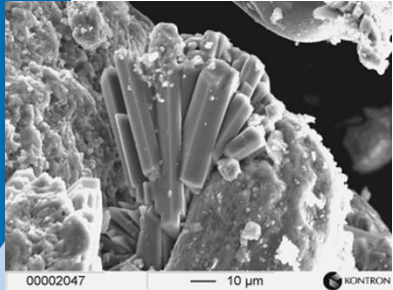
Development, testing, quality control and application of materials based on

- Cementitious materials
- Cement / bentonite mixture
- Geopolymers
- Clay
- Water glass / colloidal silica
- Latex / bitumen emulsions
- Acrylates
- Polyurethanes / Epoxides
-



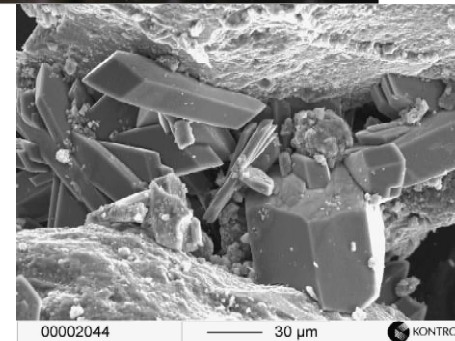
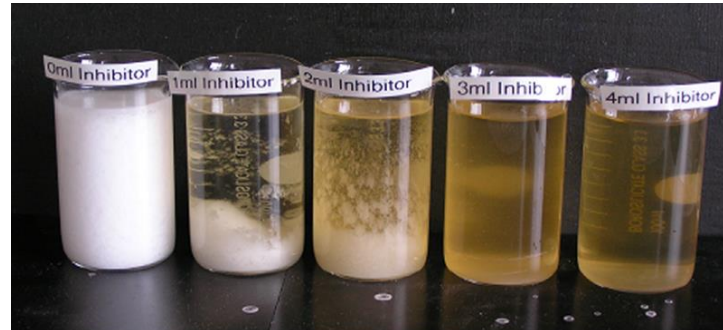
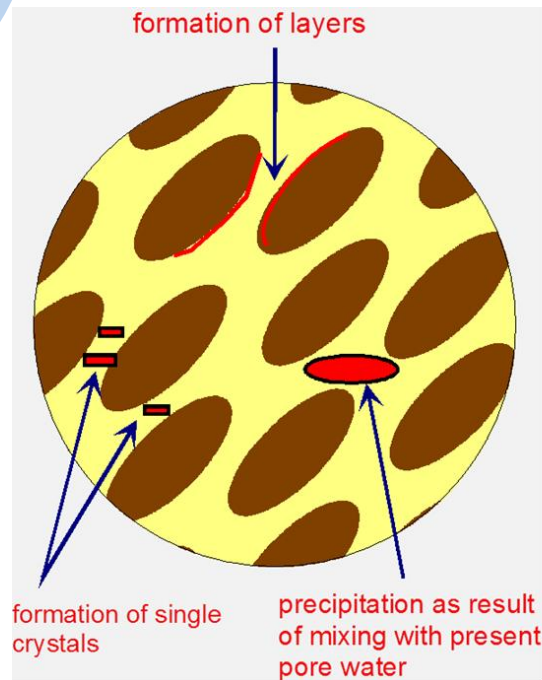
Technologies for geotechnical applications developed by IBZ

- ❑ In-situ immobilization of heavy metals by overlaying or reactive minerals / soluble surfaces with insoluble minerals
- ❑ Grouts for the encapsulation of water bearing areas, for sealing of water inflows into mines, shafts and tunnels and soil stabilisation based on:
 - ❑ Solutions leading to directed mineral formation
 - ❑ Bitumen / Latex emulsions
 - ❑ Metasilicate solutions
 - ❑ Sodium silicate / silica sol systems
 - ❑ Special cements / polymers (Acrylates, Polyurethanes...)
 - ❑ Polyacrylamide, Hydrogels etc.
- ❑ Consolidation of tailings by in-situ crystallization processes
- ❑ Materials for cut-off wells based on bentonite, fly ash, cement



Heavy metal immobilisation

- Conversion of dissolved or soluble contaminants into in-soluble compounds
- Use of solutions supersaturated in special minerals (BaSO_4 , CaCO_3 , silicates, gypsum or others) which lead to a directed crystallization process in soil or rock formations.



We offer:

- Detailed process development based on comprehensive laboratory and pilot scale testing.
- Verifying of technologies based on physico-chemical modeling.
- Development of feasibility studies concerning processing possibilities and market perspectives.
- Development of studies summarizing the State of the Art of currently available technologies.
- Experimental verification of proposed technologies.
- Realization of in-house testing as well as pilot plant testing in the costumers facilities.
- Evaluation of processes based on mass and energy balances (water consumption, energy efficiency etc.).
- Optimization of tailings management.
- Training courses (geochemistry, balancing of evaporation processes, solid-liquid phase equilibriums etc.)





**We would be pleased to support you in your
projects !**

IBZ-Salzchemie GmbH & Co. KG
Gewerbegebiet „Schwarze Kiefern“

09633 Halsbrücke, Germany

tel. : +49 (0) 3731 200155

Fax: +49 (0) 3731 200156

gerald.ziegenbalg@ibz-freiberg.de
www.ibz-freiberg.de