

SINTEF Materials and Chemistry

Expertise in minerals



Characterisation

Processing

Purification processes

Excess materials

Environment and society

SINTEF's expertise in minerals

Both in Norway and all around the world, a great deal of attention is being paid to exploring, producing and processing of mineral raw materials. This is due to growing demand for metals and minerals, while prices are rapidly rising.

The EU has launched its own raw materials initiative, and in Norway the government presented its own strategy for the minerals industry in March 2013. The state has already allocated NOK 100 million to expand prospecting in Northern Norway, and R&D activity in this industry is expected to rise in the near future.

SINTEF is the largest independent research organisation in Scandinavia. We create value via knowledge, research and innovation, and develop solutions and technology that are adopted by industry



and the public sector. With a staff of around 2100 from 70 different countries, we are a broadly-based research group with international top-level expertise in science and technology, medicine and the social sciences.

In the geosciences, we are active in a wide range of areas, and we employ a large number of highly motivated experts. In collaboration with our clients and partners, we strive towards greater sustainable value-adding, based on mineral raw materials.



Characterisation

Characterisation of minerals is of particular importance if we wish to understand how metal ores and minerals can find industrial applications.

In close collaboration with NTNU, SINTEF offers a wide range of analytical methods for characterisation of mineral raw materials from which metals and industrial minerals can be produced, and for use in the building and construction industry:

- Liberation analysis
- Particle analysis
- Particle size analysis
- Chemical analyses
- Mineral analyses
- Process-mineralogy analysis



SINTEF assays metal ore concentrates for the Norwegian mining industry.

Processing

Minerals need to be processed in order to extract, process and produce commercial mineral products.

SINTEF offers research expertise and competence in a number of areas in the field of mineral processing:

- Mining and mineral extraction
- Optimisation of raw materials
- Processing and process chemistry
- Process technology and modelling
- Processes for low grade raw materials

Research at Rana Gruber is aimed at increased value-adding and applications for iron ore with the aid of natural gas.



Purification processes

In many cases, further processing and value-adding are performed via pre-treatment, metal production or for special industrial applications. SINTEF Materials and Chemistry possesses top-level expertise in a wide range of purification processes:

- Agglomeration and pelletising
- Metal production
- Natural gas-based product development from mineral raw materials
- Special metals and rare earths
- Urban mining, recycling and recovery of raw materials and metals

Raw materials and process optimisation are performed by the Norwegian ferro-alloy industry, with energy efficiency and improved utilisation of raw materials particularly in mind.



Excess materials

In the future, it will become increasingly difficult to obtain permission to dispose excess materials, and research is therefore needed to explore alternative solutions.

For many years, SINTEF has been studying:

- Alternative uses for excess materials
- Development of new areas of application for excess materials
- New processes for reducing excess materials, recycling and sustainable utilisation

SINTEF has been doing research on widening the range of applications of many surplus materials from the Norwegian minerals industry.

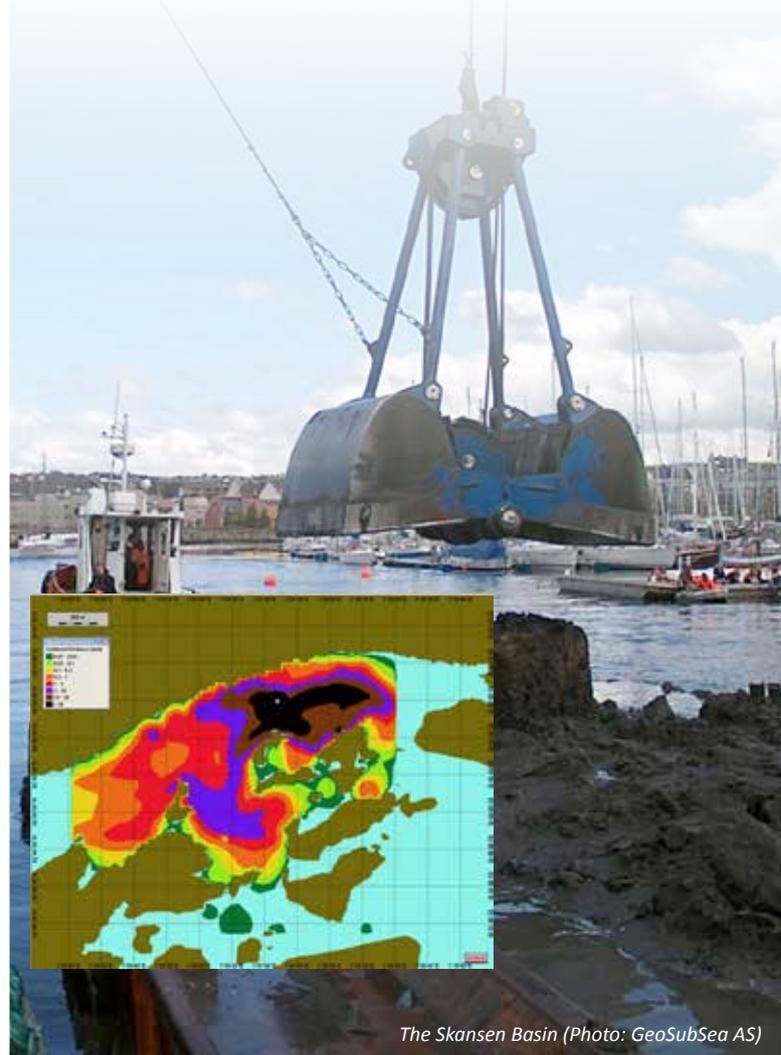


Environment and society

SINTEF can point to many years of expertise in, and experience of, problems related to societal and environmental challenges:

- Society and consequences
- Environmental problems of run-off and rehabilitation
- Disposal at sea and on land, including environmental modelling
- Environmental aspects and investigations of chemicals used in mining and processing

The figure on the right shows an example of a simulation of tailings disposal at based on SINTEF's DREAM model.

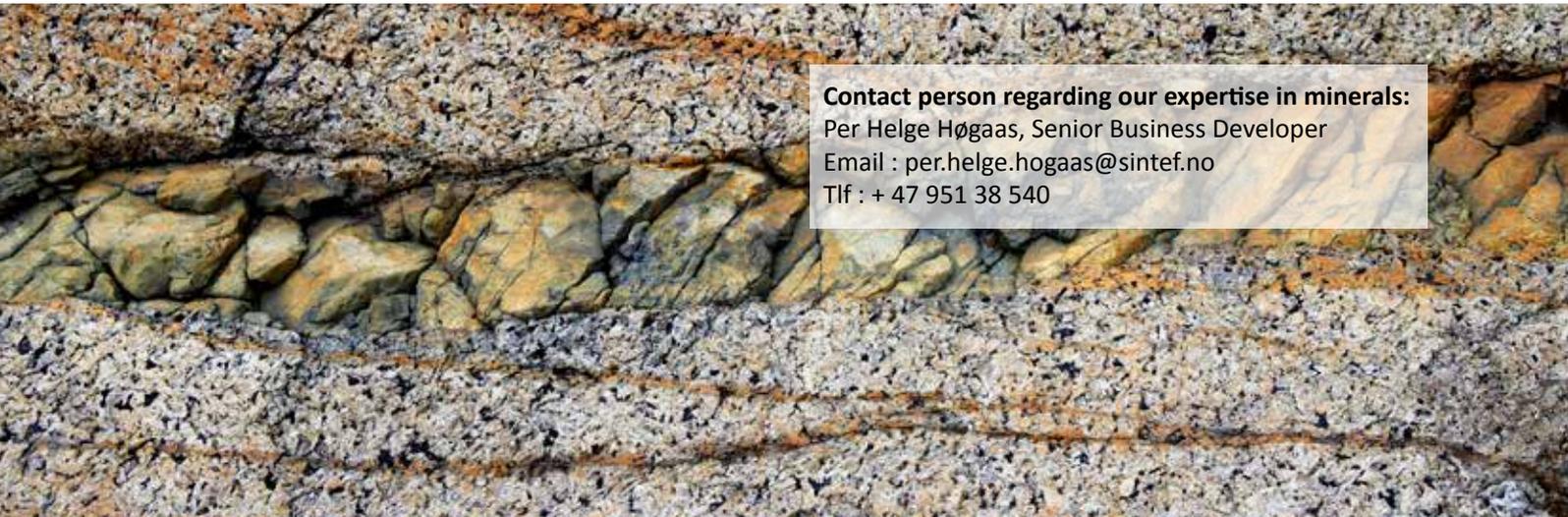


The Skansen Basin (Photo: GeoSubSea AS)

SINTEF Materials and Chemistry

SINTEF Materials and Chemistry is a contract research institute which offers a high level of expertise in materials technology, advanced materials and nanotechnology, applied chemistry and biotechnology. We collaborate closely with industry in the fields of petroleum, environmentally friendly energy and industrial process technology.

Around 100 of our scientific staff are directly involved in characterisation, mineral processing, metallurgy, process chemistry, process technology, nanotechnology and numerical modelling. We operate laboratories that deal with most core areas of materials characterisation, process technology, polymer chemistry, biotechnology and environmental investigations.



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