experimental hydrothermal geochemistry

Simulating and studying the thermochemistry of geothermal systems.

GNS Science has established a specialist experimental geochemistry laboratory to study the thermochemistry of geothermal systems, both low enthalpy and those with temperatures up to, and above, the critical point.

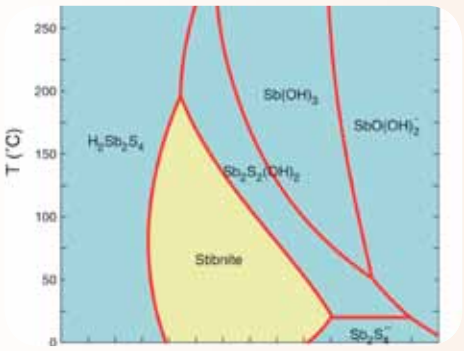
This continues our strong history of influential contributions to the understanding of the interactions between high temperature fluids and host rocks in geothermal systems.

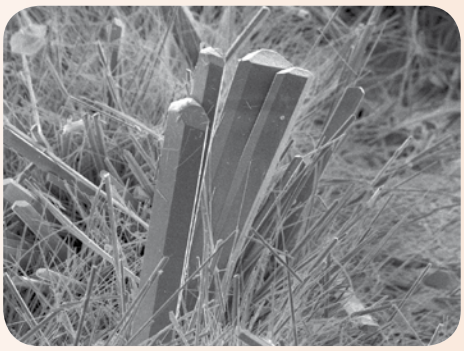
The unique apparatus can simulate site-specific conditions to understand water-rock interactions, measure thermodynamic properties, study rock composition and permeability, and investigate production issues.

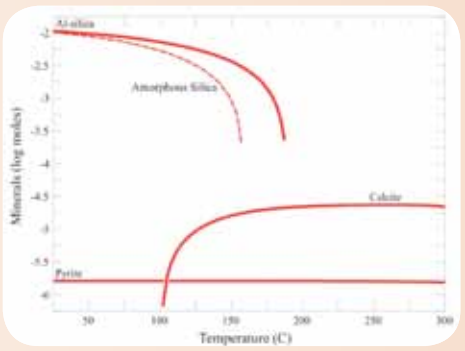
at a glance →

- → **Water-rock interactions** Simulation of water-rock interactions up to 400°C and 500 bars. Assessing the effect of geothermal development on host rock composition and permeability.
- → **Mineral reactions** Studying the modification of rock properties due to water-rock interaction.
- → **Permeability** Changes in aquifer permeability during injection. Modification of fracture permeability during fluid flow, due to fluid-rock interaction.
- → **Tracer suitability** Temperature and pressure stability of tracer chemicals in the geothermal environment.
- → **Thermodynamic stability** Measuring thermodynamic properties of alteration minerals and metal complexes in geothermal systems and power stations.
- → **Scaling & corrosion** Formation of scaling and corrosion products in geothermal reservoirs and power station infrastructure, and testing of inhibitors.

Experimental hydrothermal geochemistry simulating thermochemistry







hydrothermal testing apparatus →

→ **Hydrothermal apparatus** Designed for simulating geothermal reservoir conditions. Two temperature and pressure controlled large volume (0.36L) rocking autoclaves capable of reaching 400°C and 500 bars.

→ **Simulation** Hydrothermal fluids are passed through rock material, recreating hydrothermal flow in a geothermal reservoir. Changes to rock composition and properties are monitored.

→ **Problem solving** Simulating a wide range of site-specific reservoir and power station conditions. Encompassing temperatures and pressures from ambient to above the critical point of water.

about us →

The GNS Science geothermal team is internationally recognised for innovative, robust geoscientific research, expertise and consultancy advice. We have been supporting the geothermal community in New Zealand and internationally for over 50 years.

Our experienced professionals integrate geology, geophysics, geochemistry and modelling expertise for exploration, drilling, environmental sustainability, field development, optimal production, and ongoing resource management.

contact us →

Contact us to find out how we can address your unique question, and support the success of your project.

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