

Geothermal

Geochemical Exploration

Geochemical exploration plays a very important role in geothermal exploration. Chemical composition of geothermal steam and water from natural manifestations provides initial constraints on reservoir temperature and production properties of the geothermal fluid.



Geochemical exploration surveys, as carried out by Iceland GeoSurvey, yield important information about the temperature of the geothermal reservoir. Temperature sensitive equilibria between the geothermal waters and secondary minerals in the reservoir control the composition of the geothermal steam and water accessible in geothermal manifestations on the surface.

Chemical composition of geothermal steam and water also provides initial information about production properties with respect to scaling and corrosion problems as well as potential environmental concerns related to utilization of the reservoir fluids. Conservative components in geothermal steam and water and stable isotopes provide valuable information about the origin of the geothermal solutions.

Soil gas studies may provide important information about fluid pathways to the surface and can be used to identify feasible drilling targets.

A joint interpretation of all geoscientific data (geochemical, geological, and geophysical) is a crucial last stage in geothermal exploration.

Iceland GeoSurvey offers the following geochemical services for geothermal exploration:

▶ **Specialized collection of samples of geothermal steam and water**

Many components in geothermal steam and water are sensitive and need special preservation treatments upon sampling.

▶ **Analytical services**

Iceland GeoSurvey has a fully equipped geochemical laboratory for analysis of all relevant major and trace components of geothermal solutions as well as stable isotopes of hydrogen and oxygen in water and steam.

Some sensitive components are analyzed in situ during sampling.

▶ **Diffuse soil degassing surveys**

Iceland GeoSurvey has extensive experience in measurements of diffuse soil degassing in geothermal fields for exploration and environmental monitoring purposes.

▶ **Hydrogeological studies and chemical surveys of natural surface waters in geothermal fields**

Provide important information about recharge of the geothermal system as well as valuable data for defining environmental baseline for geothermal projects.

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