



Gas-Water-Rock Interactions Laboratory

Prevention of industrial risks related to underground operations and exploitation of georesources requires a comprehensive understanding of the interactions between rock, water and gas. This aims to better assess the long term performance of the geosystem and their potential geoenvironmental impacts.

INERIS has an advanced experimental laboratory to develop industrial and research studies in controlled conditions, providing high quality data.

Lab experiments provide qualitative and quantitative insight in the physical processes for hydrogeochemical and reactive transport modeling. In silico studies offer then a unique way to better predict physical properties changes and large-scale fluid migration impact on any far-field boundary of interest.



Highlights

Gas adsorption on rocks

Batch reactors to simulate reservoir and mine conditions

Multi lab stations for parallel experiments

Calibration test benches for field monitoring systems

Fields of application

Underground energy storage

CO₂ geological storage

Coal-Bed Methane

Geological waste disposals

INERIS

controlling risks |
for sustainable development |

Gas-water-rock interactions laboratory

General focus of our experimental capabilities is related to energy and mineral georesources assessment studies, greenhouse gas geological storage and water quality studies. INERIS provides expertise and experimental support to research organizations, agencies and industries. Our routine analyses and services are :

Multi-gas sorption onto rocks

Gravimetric or volumetric measurements. Experimental sorption-desorption isotherms and modeling (e.g. Langmuir's parameters).

Application:

- Assessment of CO₂ storage capacity
- Coal Bed Methane and CO₂-enhanced CBM

Geochemical alteration of rocks in reservoirs and mines

Batch experiments on rocks under high pressure and temperature, acidic conditions. Monitoring of water quality and gas phase composition. Comparison with geochemical models. Measurement of rock degradation.

Application:

- Assessment of cap-rock sealing efficiency for energy storage sites
- Production of noxious atmosphere in underground cavities

Monitoring and risk assessment related to gas release in underground geostructures

Direct method to estimate gas flux at surface, coal seam gas content or gas release under hydrostatic pressure. Customized design, calibration and validation of permanent field monitoring stations.

Application:

- Gas release from waste disposal or from gas underground storage
- Safety at work in tunnels or in mines

For customized measurements and specific applications, please contact us.

