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Title of Ph.D. thesis: Sequestration of carbon dioxide in basalt

Description:

The first part of my Ph.D.-thesis involves a field study investigating whether or not heavy metals are likely to be mobilized during CO₂ sequestration in basalt. To assess toxic metal mobility during basalt carbonation, we performed a detailed study of the trace metal composition of the ground water surrounding the Mt. Hekla volcano in southwest of Iceland. The second objective of my thesis is to experimentally measure the effect of composition of the aqueous solution on the kinetics of the dissolution of basaltic glass. In particular I will concentrate on the effect of SO₄²⁻ on the rates of dissolution.

Supervisors: Dr. Sigurður R. Gíslason Institute of Earth Sciences, University of Iceland
and **Eric H. Oelkers**

Education: M.Sc. in geo-chemistry from the University of Tromsø, Norway 2005 and B.Sc. in geology from the University of Tromsø, Norway 2003.

Papers

- **Flaathen, T.K.**, Gíslason, S.R., 2007. The effect of volcanic eruptions on the chemistry of surface waters: The 1991 and 2000 eruptions of Mt. Hekla, Iceland. *Journal of Volcanology and Geothermal Research* 164, 293-316

Abstracts:

Flaathen, T.K., Oelkers, E.H., Gíslason, S.R. Can CO₂ be safely sequestered by carbonization of basalt? The 33rd International Geological Congress, Oslo 2008.

E. H. Oelkers, **T. K. Flaathen**, S. R. Gíslason, J. Schott, M. Hacini, 30 years of progress in performing real-time reactive transport calculations? Réunion des Sciences de la Terre, Paris, France, 2008.

Flaathen, T.K., Gíslason, S.R. The groundwater beneath Hekla volcano, Iceland; a natural analogue to CO₂ sequestration. Goldschmidt Conference, Germany, 2007

Flaathen, T.K. and Gíslason, S.R. Contamination of Surface Waters caused by Volcanic Ash Fall. EGU2007-A-04401. EGU General Assembly, Vienna, Austria 2007.

Flaathen, T.K. and Gíslason, S.R. The environmental effect of the dissolution of pristine volcanic ash on surface waters. A George P.L. Walker symposium on Advances in Volcanology, Reykholt, Iceland, 2006.

Flaathen, T.K. and Gíslason, S.R. Chemical weathering of pristine volcanic ash and metal salts in the vicinity of the Hekla volcano, Iceland. EGU-06-A-00914. EGU General Assembly, Vienna, Austria, 2006.

Flaathen, T.K. and Gíslason, S.R. Áhrif eldgosa á efnasamsetningu yfirborðsvatns. Natural Science Symposium, Reykjavík 2006.

Flaathen, T.K. and Gíslason, S.R. The effect of volcanic eruptions on the chemistry of surface waters. Natural Science Symposium, Reykjavík 2006.

Flaathen, T.K. and Gíslason, S.R. The effect of volcanic eruptions on metal mobility in surface waters. 27th Nordic Geological Winter Meeting, Abstract volume page 35, Bulletin of the Geological Society of Finland, Special issue 1, 2006.

Reports:

Gíslason, S.R., Snorrason, Á., Ingvarsson, G.B., Eiríksdóttir, E.S., Sigfússon, **Flaathen, T.K.**, Camargo, L.G.Q., Elefsen, S.Ó., Harðardóttir, J., Þorlákssdóttir, S.B., Torssander, P., 2006. Efnasamsetning og rennsli straumvatna á slóðum Skaftár 2002-2006.

Thesis:

Flaathen, T.K., 2005. CO₂-H₂O experiments on minerals from the Tellnes ilmenite ore body (in Norwegian with English abstract), M.Sc. thesis, University of Tromsø, Norway.

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