Geochemical inventory of the Upper Rhine Graben geothermal system

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The Upper Rhine Graben (URG) has been the target for intensive research throughout the past decades because of its high geothermal potential [1]. Exploitation of deep geothermal sources is focused on areas of enhanced geothermal gradients, e.g. at the Soultz-sous-Forêts and the Bruchsal sites.

Fluids produced from deep geothermal wells consist of Na-Cl brines, while shallow aquifers are dominated by Ca-HCO_3, Ca-SO_4, and Na-HCO_3 type groundwater.

In the present study, stable isotope tracer methods (Sr, H, O) are combined with geochemical data of thermal waters and rocks/minerals to elucidate the origin of water, sources of solutes, and connections between shallow and deep aquifers in the URG and adjacent Black Forest Mountains. Fluid inclusion studies were performed to further obtain information on the composition and history of trapped fluids in the rocks. H and O isotope data were employed to characterize potential groundwater recharge areas in the adjacent Black Forest Mountains.

The study was performed within the ANEMONA project, which is funded by the Federal Ministry for Economic Affairs and Energy (BMWi), Germany, under the Energy Research Program.

References:

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