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What do the thermal springs and their related precipitates tell us about interacting geofluid systems?

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Geofluid systems are in the centre of interest nowadays despite we know less about them considering their interrelationships. Their fluids can have different origin: meteoric, oceanic or evolved water (Deming 2003). If we focus on the continental lithosphere, we can count on different fluids of different origin, which are mobilized by different driving forces such as hydraulic gradient, buoyancy effect, compaction, tectonic compression etc. In the last decades it was recognized that fluids play role in nearly all geologic processes and are ubiquitous in the continental crust to depths of at least 10 to 15 km. Therefore, continental crust started to handle as “two-component” system based on rock-fluid interaction (Ingebritsen et al. 2006). In the upper continental crust, the permeability of rocks may be sufficient to keep up continuous flow systems for 1-10 million years. Due to the operation of geofluid systems on geological time scale, we could reveal that geofluids act as a geologic agent, therefore they have an outstanding effect on every geological processes, such as mobilisation, transportation, and accumulation of matter and heat. Consequently, geofluid systems can be characterized by complex physical, geochemical and microbiological processes. The presentation displays thermal springs arise at the boundary of confined and unconfined carbonates as geological manifestation of interacting geofluid systems. We try to show those chemical components which are mobilized and transported, and demonstrate how the mobilized matter is accumulated around thermal springs at the surface. The example of Buda Thermal Karst (BTK), Hungary demonstrates the concept of the ENeRAG project ’Dynamic System Approach for Geofluids and their Resources’ that handles fluids and resources together in the Earth crust.
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References: Deming D. (2003): Introduction to hydrogeology (2003)
Ingebritsen, S.E., Sanford, W.E., and Neuzil, C.E., (2006): Groundwater in Geologic Processes, 2nd edition: Cambridge, Cambridge University Press, 536 p.