



Characterisation of the chemical composition in geothermal hot springs in Iceland and Serbia

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Geothermal hot springs are located in various tectonic environment proving environmentally friendly energy source to fulfil energy demand. The geothermal energy sources are often associated with divergent tectonic plate boundaries as in the Icelandic case or in orogeny geological settings as in the Serbian case. The chemical composition of a hot spring is a signature of the sub-surface geology and its chemical composition. Hence, the comparison of the chemical composition of geothermal sources can help us provide more detailed information prior to sub-surface exploration. In order to assess the suitability of geothermal sources we analysed the chemical composition in Icelandic and Serbian geothermal sources. For this purpose we collected samples from various hot springs in Iceland and in Serbia and analysed them using ion chromatography (IC) to determine anion concentrations and using inductively coupled plasma-optical emission spectrometry (ICP – OES) to determine cation and other element concentrations. The preliminary results reveal that chemical composition reflects differences between locations of sampling as well as the depths from which the fluid was extracted. Preliminary data obtained from the chemical analysis from sources located near to the Ocean in Iceland indicate a high concentration of Na⁺, K⁺ and Cl⁻ ions, revealing an inflow of sea water. The data from the chemical analysis of the samples obtained from sources in Serbia, however, shows a high concentration of Na⁺, Ca²⁺ and Mg²⁺. These results reveal that Serbian geothermal sources are characterized by very hard water and accordingly have to be used with precaution. Further analysis of the temporal evolution of the chemical composition is advisable before sub-surface exploration.