



Hydrothermal pore fluid characterization of the Azores Plateau

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During the “Azores Tephra” cruise M141 on the German research vessel RV Meteor in September 2017 we carried out pore fluid analyses of 28 gravity cores recovered from the Azores Plateau. The pore fluids were analysed for total alkalinity, ammonium, methane and other major elements such as Na, Ca, Cl, B, Mg and Sr and allow, for the first time, to perform a thorough analysis of sub-seafloor fluid origin and secondary alteration processes in this area of intense tectonic and volcanic activity.

Pore fluids in sediments of the Azores Plateau are generally affected by the alteration of marine volcanic deposits. Moreover, due to local heating of the plateau, shallow hydrothermal fluid venting occurs e.g. known at the D. Joao de Castro seamount in the Terceira Rift (Cardigos et al., 2005). Here, for the first time, we present fluid geochemistry data from deep-water hydrothermal seepage areas of the Azores Plateau. The present status of geochemical analyses, suggests that there are two different types of hydrothermal seepage systems: In many places on the plateau a slightly acidic (CO₂-rich) hydrothermal fluid percolates through the sediments; Along the Terceira Rift, which marks the northern border of the plateau, also methane-rich fluid seeps are suspected.

We will present a comprehensive interpretation of the available data set, with respect to geochemical processes occurring at the hydrothermally-driven seepage systems, fluid and gas sources, the activity of the seeps, and the role of ash alteration.

References

Cardigos, F., Colaço, A., Dando, P. R., Ávila, S. P., Sarradin, P. M., Tempera, F., Conceição, P., Pascoal, A., and Serrão Santos, R., 2005, Shallow water hydrothermal vent field fluids and communities of the D. João de Castro Seamount (Azores): *Chemical Geology*, v. 224, no. 1-3, p. 153-168.