



Organics in hydrothermal fluids from 4 ultramafic-hosted vents of the MAR. Results from the SERPENTINE cruise (2007).

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Ultramafic-hosted hydrothermal sites are characterized by mantle outcrops. On the Mid-Atlantic ridge, the Eurasian and American plates are moving apart resulting in the oceanic crust to tear up and to let the mantle rocks outcrop. Circulation of seawater, along the faults, within the mantle alters the periodites via the serpentinisation process, which produces a large amount of H_2 . Notably, H_2 is a great source of energy for further chemical reactions. Besides, a high CH_4 concentration in the water column is associated with ultramafic hydrothermal activity. This methane has been suggested to be abiogenic and to be formed via a Fischer-Tropsch synthesis ($3H_2 + CO$ gives $CH_4 + H_2O$). The isotope-ratio values support the later hypothesis. This has lead to the idea of abiogenic formation of larger organic compounds such as hydrocarbons or key molecules for the origin of life issue. Both thermodynamics and laboratory work support this idea, but field data had not been studied yet.

During the EXOMAR (2005), SERPENTINE (2007) and MoMARDREAMNAUT (2007) cruises conducted by IFREMER, France; hydrothermal fluids from the MAR have been collected at different hot vent sites (Rainbow, Lost City, Logatchev and Ashadze). Their geological settings vary, leading to largely different fluids features as for T, pH, Cl and H_2S concentration. Innovative and efficient techniques have been developed, used and improved (IFREMER, Brest) to concentrate, isolate and extract

organic compounds from the fluids: SPE (Solid Phase Extraction)-GC-MS. Mainly hydrocarbons (C8 to C18), carboxylic acids and methyl esters were clearly identified by comparison of recorded mass spectra with library data. $\delta^{13}\text{C}$ values have been measured by GC-IRMS (VUB Brussels) and were in the range -20‰ to -45‰, which did not allow to conclusively support or reject an abiotic origin.

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