

An assessment of the global on-axis hydrothermal element fluxes

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The global hydrothermal on-axis element flux between oceanic lithosphere and the ocean can be calculated by relating vent fluid compositions and their respective temperatures to the energetic budget of the oceanic lithosphere. Today these element fluxes are still barely constrained although they play an important role in affecting ocean chemistry. Uncertainties in estimating these element fluxes arise by two factors: First, calculations have been carried out with one unique vent fluid composition that is meant to represent the global compositional range of hydrothermal fluids (ignoring the chemical diversity of vent fluids). Secondly, the role of different geological settings (eg. mid-ocean-ridges, back-arc basins, volcanic arcs) and sediment-hosted vs. sediment-free hydrothermal systems has been neglected. The recently established MARHYS vent fluid database helps to improve the estimation of global on-axis element fluxes by enabling an assessment that considers the chemical diversity and nature of hydrothermal fluids in different geologic settings to provides a more robust estimation of these fluxes.