



## **Metal sources of black smoker chimneys, Endeavour Segment Juan de Fuca Ridge: Pb isotope constraints**

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The hydrothermal chimney sulfides and vent cap chimney samples from the Endeavour Segment, Juan de Fuca Ridge, a sediment-starving mid-ocean ridge, display Pb isotope compositions that are indistinguishable from the local basalt, indicating the primary Pb source of sulfides and hydrothermal fluids in Endeavour Segment is basalt. Mean while the relative large Pb isotope composition variation range when compared with other sediment-starving ridges and the anomaly Pb-Pb plot, indicating a sediment component contribution. Results of binary mixing models suggest that the sediment sources contribution is no more than 1%. Combining the Pb isotope data with the chemistry data of hydrothermal fluid within the Endeavour Segment, we suggested the sediment component may locate in the recharge zone, rather than high temperature reaction zone. In addition, the sediment component should have a lower  $^{206}\text{Pb}/^{204}\text{Pb}$  inferred from the “BF” line which through the densest cluster of Pb isotope data. The lower  $^{206}\text{Pb}/^{204}\text{Pb}$  sediment component may have a common provenance with that of Middle Valley, providing a new insight on the evolution of the north end of the Juan de Fuca ridge.