Supporting Information for

The Behaviour of Iron and Zinc Stable Isotopes Accompanying the Subduction of Mafic Oceanic Crust: A Case Study from Western Alpine Ophiolites

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Captions for Table S1: “Major and trace element concentrations”
Caption for Table S2: “Fe and Zn isotope compositions”

Introduction

The supporting information produced as part of this study is included here. Table S1 major and trace element concentrations of the samples used as part of this study. Table S2 contains the Fe and Zn stable isotope compositions of the same samples given in S1. A detailed description of the analytical methods used to generate these data are provided in the main body of the manuscript. Figures S3 and S4 show Rayleigh distillation models for Fe and Zn isotopic fractions between eclogite and fluid respectively. The figure S5 show Zn isotope composition of samples plotted against major elements and selected trace elements/trace element ratios.
Figure S3. A Rayleigh distillation model to predict the evolution of $\delta^{56}$Fe accompanying decreasing Fe concentration with basalts. We use a starting MORB Fe concentration and Fe isotope composition from Teng et al., 2013 and a $\alpha_{\text{fluid-rock}}$ factor of 0.99984. This $\alpha_{\text{fluid-rock}}$ was selected as it gave the best modelled prediction compared to our average measured $\delta^{56}$Fe from the Zermatt-Saas basaltic eclogites.
Figure S4. A Rayleigh distillation model to predict the evolution of $\delta^{66}$Zn accompanying loss of Zn in the presence of SO$_X$ and CO$_X$ bearing fluid. We use a starting MORB Zn concentration and Zn isotope composition from Wang et al., 2017. For a SO$_X$ bearing fluid a $\alpha_{\text{fluid-rock}}$ factor of 1.00019422 is applied. For a CO$_X$ bearing fluid a $\alpha_{\text{fluid-rock}}$ factor of 1.000121678 is applied. The $\alpha$ factors were calculated from Black et al., 2011 for a fractionation between silicate-aqueous sulphate as ZnSO$_4$ in the fluid phase and from Fujii et al., 2011 for a fractionation between silicate-aqueous carbonate as ZnCO$_3$ in the fluid phase. This assumes that all Zn in the metabasalts is stored in octahedral sites in the silicates and that fluid release from the eclogite is occurring at 600 °C.
Figure S5. Zinc isotope composition of the samples studied here plotted against indices of
magmatic differentiation and selected fluid mobile elements.