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Reduction of buried oxidized oceanic crust during subduction

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Abstract

The relationship among subducted oxidized oceanic crust, oxidation state of subarc mantle, and arc magmas is one of the important aspects to evaluate convergent margin tectonics. However details of the oxidized mass transferred from buried oceanic crust to the overlying subarc mantle wedge remain obscure. Here we investigate the Songduo eclogites from south Tibet formed by the subduction of paleo-Tethyan oceanic crust, and identify an abrupt decrease in pyrope and increase in almandine contents from the mantle to rim of garnet grains. This is coupled with a decrease in the Fe^{3+} content of epidote and $\text{Fe}^{3+}/(\text{Fe}^{2+}+\text{Fe}^{3+})$ ratios from garnet core to rim domains, as well as speciation of calcite, a new mineral phase, in the rock matrix. Minor sulphates

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