

# Petrographic characteristics of mantle xenoliths in Quaternary alkali basalts, southern Ethiopia

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The Quaternary alkaline basalts from the East African Rift System in southern Ethiopia carry mantle peridotite xenoliths. We present petrographic characteristics for these xenoliths including microscope observation and mineral compositions by EDX and bulk-rock compositions by XRF. In the East African Rift System, mantle plume upwelling and subsequent uplifting have occurred, accompanied with magmatism. The mantle peridotite xenoliths are important to investigate the nature and evolution of the lithospheric mantle beneath this region. Total of 7 samples were examined; all are spinel lherzolites. The xenoliths can be divided into two types. The one is anhydrous spinel lherzolite. The other is hydrous spinel lherzolite that includes hydrous minerals, such as amphibole and phlogopite, suggesting that they had been metasomatised. Both types of xenoliths have either protogranular or equigranular texture; these textures are identified in both type. The compositions of spinels (Cr number =0.062-0.117, Al<sub>2</sub>O<sub>3</sub>=59.01-64.43 wt%) and cpx (Mg number = 88.37-91.71, Al<sub>2</sub>O<sub>3</sub>=5.18-6.67 wt%) indicate the features of the peridotites which are not depleted in the basalt's components. Furthermore, bulk-rock major element compositions overlap the slightly depleted primitive mantle compositions. The equilibration temperatures calculation yield 822-1040 C. There are no remarkable difference in the compositions of minerals and bulk-rock among the two types of peridotites.