The PGE and Os isotope variations in the mantle transition zone from the Samail Ophiolite from the Oman Drilling Project Cores

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Oceanic plates are formed at mid-ocean ridges and subducted into the mantle at convergent plate margins. This planetary process returns many surfacial materials to Earth's interior contributing to a global recycling system. However the characteristics of and relationships between the oceanic crust and the underlying upper mantle remain poor understanding. Much of our knowledge of the construction processes of the lower oceanic crust comes from of ophiolites; ancient blocks of oceanic lithosphere exposed on land. To generate better understanding of the oceanic crust and its uppermost mantle, the Oman Drilling Project drilled a suit of diamond-cored boreholes from 2016 to 2018 into the Samail ophiolite Oman, the world's largest sequence of upper oceanic lithosphere exposed on land.

Here we report the preliminary results of the PGE abundances and Os isotope ratios from lower crustal gabbros and upper mantle peridotites sampled by the OmanDP drill cores and compare to data from Oman outcrops. Similar PGE patterns in the drillcore derived gabbros and outcrop samples indicates that PGE are probably resistant to surficial weathering processes in Oman. The average of the age corrected Os isotope ratios at 96 Ma in the drillcore gabbros (0.14) shows clearly higher than the estimated mantle Os isotope ratios at that time (CHUR: 0.127 and PUM: 0.129).