Melting and melt-peridotite interactions in heterogeneous upper mantle sources of primitive volcanics

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It is now widely accepted that many primitive mafic volcanics contain components derived from upper mantle melting of non-peridotitic lithologies, some of which may have been introduced into the magma source regions by deep subduction and subsequent entrainment into upwelling mantle. Such lithologies may include high pressure forms of mid-ocean ridge basalt, gabbro and pelagic sediments (eg. pelites or carbonate-rich materials).

In this presentation we will compare the melting behaviours and partial melt compositions of some of these different lithologies. We will also report high pressure experiments (3.5 GPa) designed to explore the nature of partial melting, melt migration and reaction processes that may occur in upwelling, heterogeneous mantle, consisting of ambient peridotite and discrete bodies of eclogite (former oceanic crust).

We used a layered configuration, in which a gabbro layer was placed in contact with a garnet lherzolite layer. Run products consist of complex layered assemblages in which there is clear evidence of partial melting to produce highly siliceous liquids and refractory eclogite residue and reaction of the evolving melts with peridotite (chiefly olivine) to produce garnet + pyroxene–bearing and olivine-free reaction zones between the eclogite and peridotite. Phase compositions in the reaction zone lie exactly on the thermal divide, and close to hypersthene [Hy] in the high pressure eclogite tetrahedron. Thus, bulk compositions of such reaction material will also lie on the thermal divide. Olivine-free reaction lithologies similar to the reaction zone material observed in these experiments have been recently proposed as source materials of some Hawaiian and other intraplate magmas**.**

Their high pressure melting and phase relations remain to be explored experimentally, but they may produce picritic liquids with minor element characteristics that reflect their olivine-free nature (e.g. relatively high Ni compared with partial melts of peridotite.

Geochemical exploration gold in Shanegh area, Delijan, Isfahan

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The Shanegh area is located in central part of Sanandag-Sirjan zone, 28km southeast of Delijan. Rock units exposing in the area consists of sedimentary (carbonates, sandstone, siltstone) volcano- sedimentary (andesite to andesitic tuff,tuff) and intrusive host rocks. The volcano- sedimentary units thought to be of Eocene to Quaternary age which has been intruded by plutonic units. The main host rocks are monzonite, quartz monzonite, andesite, diorite. The host rocks have been altered by pervasive hydrothermal fluids. The alterations are sericitization, kaolinitization, carbonatization and silicification. The host rocks are characterized by fault or shear zones, vein systems, stockwork and dyke mineralization. Ore mineral assemblages are pyrite, chalcopyrite, Fe-oxide and Fe-hydroxides. We did not find gold minerals in the microscopic studies but the gold has been found in the lithogeochemical exploration. During this study 230 samples were analysed by ICP-EOS for 44 elements. The results show that the average of Au(80ppb), Cu (68ppm) and Ag (0.8ppm) in the southern part of the area. The geochemical data shows there is good correlation between Au to Bi, Ag, Cu, As, Sb, Zn and Pb.