Hawaiian tholeiite in Iceland

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We report major and trace elements and radiogenic isotope composition of lavas, as well as high precision olivine phenocrysts analyses [1] for picrites from early quaternary Skridufell volcano from the Eastern Rift Zone of Iceland. We also present major and trace element compositions of olivine hosted melt inclusions quenched from temperature of 1270^0C.

Melts are tholeiitic in composition but show significant enrichment in incompatible elements ($(La/Sm)_n$=1.5-2.0) and depletion in HREE ($(Dy/Yb)_n$=1.3-1.5). Olivine phenocrysts (Fo 90-86) are the most Ni rich (average NiO/(MgO/FeO)= 0.083) and Mn poor (average FeO/MnO=67.3) from all analysed olivines of quaternary Icelandic lavas [1,2]. Osmium isotope composition of bulk rock [2,3] is also the most radiogenic among studied Icelandic lavas ($^{187}Os/^{188}Os$=0.13752-0.13879).

The composition of Skridufell lavas strongly suggest residual garnet and maximum for Icelandic quaternary lavas amount of pyroxenite component in their mantle source (44% [2]). Compositions of melts and olivine, closely match corresponding compositions from the shield stages of Kilauea and Mauna Kea volcanos, Hawaii [4].

[1] Sobolev *et al*. (2007) *Science* **316**, 412-417. [2] Sobolev *et al*. (2008) *Science* **321**, 536. [3] Brandon *et al*. (2007) *Geoch. Cosmochim. Acta* **71**, 4570-4591. [4] Sobolev *et al*. (2005) *Nature* **434**, 590-597.

Methanogens diversity and distribution in sediments of the Häkon Mosby Mud volcano

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Submarine mud volcanoes are formed by expulsion of mud, fluids and gases from deeply buried source. The Häkon Mosby Mud Volcano (HMMV) is an active cold seep located on the SW Barents Sea slope. The ejection of gases in the central area of the HMMV is of a mixed microbial/thermogenic origin composed of 99% CH_4 with a $\delta^{13}CH_4$ of -60‰. Despite that methanogenesis is an important microbial process at cold seeps the types of methanogens that contribute to atmospheric methane emissions, hydrate deposits and functioning of cold seeps ecosystems it is relatively unknown and only few species have been isolated. Microbial process of Anaerobic Oxidation of Methane (AOM) by putative methanotroph is proposed to be reversed methanogenesis coupled with sulfate reduction. The occurrence of AOM at the Häkon Mosby Mud Volcano (HMMV) have been demonstrated and a new clade of anaerobic methanotroph (ANME3) closely related to the *Methanococcoides* methanogens were described below the *Beggiatoa*-dominated sediments.

In this study, sediment samples were recovered by multiple corer and ROV-operated push cores during the Vicking cruise (2006) both in the central area and in sediments covered by dense microbial mats. In order to assess the vertical distribution of archaeal and methanogenic diversity, cultivation-dependent and -independent techniques were employed. Vertical distribution of culturable methanogens were monitored by PCR-DGGE.

Cultivation-independent studies of the archaeal community revealed that uncultivated lineages of *Euryarchaeota* including methanogens and *Crenarchaeota* are present in the sediments of HMMV. Methanogens related to *Methanogenium*, *Methanosarcina*, *Methanococcoides* and *Methanoculleus* genera were cultivated from depths of 0 to 14 cm in the sediments of HMMV.