Modal metasomatism in upper mantle from Eastern part of Central European Volcanic Province (SW Poland).

MAGDALENA MATUSIAK-MALEK1, JACEK PUZIEWICZ1, THEODOROS NTAFLIS2 AND MICHEL GREGOIRE3

1University of Wrocław, magdalena.matusiak@ing.uni.wroc.pl
2University of Vienna, Austria
3University Toulouse III-CNRS, France

Cenozoic volcanic rocks of mafic affinity occur abundantly in central Europe forming the Central European Volcanic Province. The ascending magmas intensively sampled upper mantle peridotites. Mantle xenoliths from the Eastern part of CEVP (SW Poland) are in general strongly depleted and nominally anhydrous.

Small amounts of hydrous phases (mostly paragastic amphibole) in xenoliths from Lutynia and Wilcza Góra were reported in literature (Blusztajn and Shimizu, 1994, Chem.Geol; Matusiak-Malek et al., 2010, Lithos). The first locality with significantly higher amounts of amphibole was described by Nowak et al. (e.g. 2010, EGU2010-9299) from Wolek Hill.

Mafic and ultramafic xenoliths from Wilcza Góra basanite form four compositional groups. Almost half of the xenoliths contain paragastic amphibole with modal compositions up to 5%. Amphibole forms: (1) intergranular grains; (2) amphibole-spinel-clinopyroxene clusters in host peridotite; (3) cores of compositional variations of host peridotite. The mg-number in amphibole-olivine vein. Composition of amphibole follows clinopyroxene II; (3) lamellae in pyroxenes and (4) number 0.860-0.908 and TiO₂-rich (3.253-3.705 wt.%) respectively. One xenolith contains vein formed of high mg-

Oxidation state of iron in a primary Martian basaltic melt

A. K. MATZEN1*, J. R. BECKETT2, A. B. WOODLAND3 AND B. J. WOOD1

1 Oxford Departmet of Earth Sciences, UK, OX1 3AN (*correspondence: andrew.matzen@earth.ox.ac.uk)
2 California Institute of Technology, Pasadena, CA 91125
3 Goethe-Universität, D-60438, Frankfurt am Main

Olivine is an extremely important mineral in the generation and evolution of basaltic melts. Roeder and Emslie [1] concluded that the olivine (ol) silicate liquid (liq), exchange coefficient, \( K_{\text{D}_{\text{Fe}^2+\text{Mg}}} = \frac{(\text{Fe}/\text{Mg})_{\text{ol}}}{(\text{Fe}/\text{Mg})_{\text{liq}}} \) (by weight), is 0.30±0.03, independent of temperature 

One-atmosphere, super-liquidus (1450°C) experiments were performed on a synthetic basalt modeled after the primitive magmas found near Home Plate (50% SiO₂; 10% Al₂O₃; 18% FeO*; 12% MgO) [3] at log\(O_2\)s ranging from -10 to -0.68. Fe\(^{2+}\)/ΣFe of the resulting glasses were measured using Mossbauer and XANES spectroscopy. Fe\(^{2+}\)/ΣFe vary from 0.06 to 0.68, and compare favorably with estimates based on terrestrial-relevant experiments [4]. Our results appear to contrast with much lower Fe\(^{2+}\)/ΣFe reported for similar experiments on a Zagami bulk composition [5].

One-atm experiments on model Martian compositions provide the tightest constraint on \( K_{\text{D}_{\text{Fe}^2+\text{Mg}}} \) because \( T \) and \( fO_2 \) are well known, allowing us to use [4] to predict the amount of Fe\(^{2+}\) present in each liquid. The median of 17 published 1-atm experiments yields \( K_{\text{D}_{\text{Fe}^2+\text{Mg}}} = 0.354±0.008 \) (error is one mean absolute deviation). Applying this \( K_{\text{D}_{\text{Fe}^2+\text{Mg}}} \) to the ol-phyric shergottites, leads to the possibility that Y980459, NWA 5789 and 2990 are liquid compositions (others appear to have accumulated olivine), identical to the results of [3].