

Combined xenolith and receiver function study, western Bohemian Massif, central Europe

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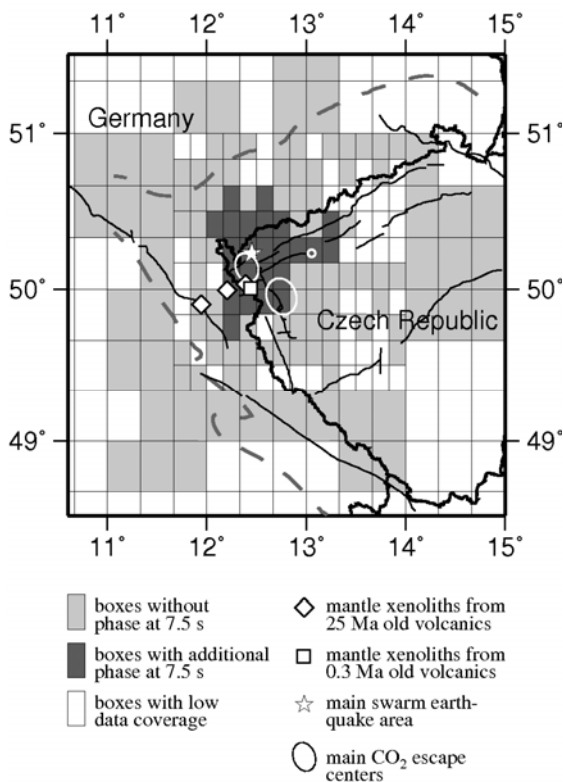
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The occurrence of strong negative phases at 7.5s Ps delay, may indicate body of partial melt at ca. 65km depth beneath western Bohemian Massif (see Figure below).

To test the hypothesis, we studied 2 suites of lithospheric mantle xenoliths, different in age (P-T-f_{O2}, petrophysical, geochemical and isotope [Sr, Nd, Pb] constraints). The xenoliths from 25 Ma old volcanics are spinel lherzolites. The suite from 0.3 Ma old volcanics represent cumulates, porous fragments of magmatic veins or porous wehrlites. These samples are strongly altered by mantle metasomatism (changes of f_{O2}, geochemical constraints, density/porosity).



Sulfide oxidation intermediates in anoxic sediments of Black and Baltic seas: Differences and similarities

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Sulfide Oxidation Intermediates (SOI): elemental sulfur (S⁰), polysulfides (S_n²⁻) and their protonated forms, thiosulfate (S₂O₃²⁻), sulfite (SO₃²⁻) and polythionates (S₄O₆²⁻) may be produced by oxidation of hydrogen sulfide by abiotic and biologically catalyzed processes, utilizing wide variety of electron acceptors (O₂, Fe(III), Mn(IV) and NO₃⁻). SOI may serve also as substrate for bacteria [1]. SOI also play important role in a variety of geochemically and environmentally important processes (e.g. pyrite formation by polysulfide pathway).

Zero-valent sulfur (ZVS) in samples was analysed by the protocol that consists of 4 procedures: 1) detection of inorganic polysulfides by methylation with methyl trifluoromethanesulfonate followed by HPLC-UV detection of dimethylpolysulfanes [2]; 2) detection of colloidal elemental sulfur, polysulfide and polythionate by reaction with hydrogen cyanide followed by HPLC-UV detection of thiocyanate; 3) pre-treatment with zinc chloride solution followed by chloroform extraction and HPLC-UV detection of elemental sulfur; 4) analysis of individual polythionates by HPLC-UV. Detection limit of each procedure was ≤2 μM. Thiosulfate, sulfite and solid phase S⁰ concentrations were studied by the methods from [1].

In sediments from both Black and Baltic seas thiosulfate prevails over sulfite in pore-waters. The main zero-valent sulfur pools in sediments are solid sulfur in sediments and dissolved polysulfidic zero-valent sulfur in pore-waters. Close to the pyritization front particulate sulfur content in sediments sharply increases, and becomes the main zero-valent sulfur pool.

The main difference between two systems is that in the Black Sea polysulfides are not in the equilibrium with particulate elemental sulfur, S₄²⁻ is the most abundant polysulfide species. In the Baltic Sea polysulfides are close to the equilibrium with particulate elemental sulfur, S₅²⁻ is the most abundant polysulfide species. Possible thermodynamic and kinetic factors, which can result in this difference will be discussed.

[1] Zopfi *et al.* (2004) *GSA Special Paper* **379**, 97-116.

[2] Kamyshny *et al.* (2006) *Anal. Chem.* **78**, 2631-2639.