

2006 Fall Meeting
Search Results

Cite abstracts as **Author(s) (2006), Title, *Eos Trans. AGU*, 87(52), Fall Meet. Suppl., Abstract xxxxx-xx**

Your query was:

"MR21A-0015"

The selected databases contain **one** document matching your query:

HR: 0800h

AN: MR21A-0015

[Percolation of Fe-FeS Melts in Partially Molten Peridotite](#)

* **Bagdassarov, N**

E|nickbagd@geophysik.uni-frankfurt.de

A|Institut für Geowissenschaften, Universität Frankfurt, Feldbergstrasse 47,
Frankfurt a. Main, D-60323 Germany

Golabek, G

E|golabek@geophysik.uni-frankfurt.de

A|Institut für Geowissenschaften, Universität Frankfurt, Feldbergstrasse 47,
Frankfurt a. Main, D-60323 Germany

Solferino, G

E|giulio.solferino@erdw.ethz.ch

A|Institute for Mineralogy and Petrology, ETH Zürich, Clausiusstrasse 25,
Zürich, CH- 8092 Switzerland

Schmidt, M W

E|max.schmidt@erdw.ethz.ch

A|Institute for Mineralogy and Petrology, ETH Zürich, Clausiusstrasse 25,
Zürich, CH- 8092 Switzerland

In order to establish a percolation threshold of FeS melts in peridotite matrix, two types of experiments have been done on partially molten garnet peridotite. Peridotite powders with 100-200 μ and 20-30 μ grain size were mixed with 5-15 vol% Fe₇₀S₃₀ composition. The first type of experiments has been done in the centrifuging piston cylinder at ETH, Zürich. The mixed powders were sealed in graphite capsules, D=2.6 mm and H=3 mm, and annealed at 1 GPa and 1150-1260° C in a piston-cylinder over 70 h. Then, the capsules have been rotated at 500 g during 2-10 h at 1 GPa. The distribution of Fe₇₀S₃₀ and partial melts has been quantified on polished sections. In the second type of experiments, the mixtures of peridotite and Fe₇₀S₃₀ were annealed at 1 GPa from 650 to 1300° C over 24-70 h in a piston- cylinder. The centrifuge experiments revealed a negligible percolation of Fe₇₀S₃₀ melts through the partially molten peridotite matrix. Only at 1260° C (18 % melting) at starting 5 vol% of Fe₇₀S₃₀ the vertical gradient is 1 %/mm, and in samples with starting 15 % Fe₇₀S₃₀ the vertical separation achieved 2 %/mm after 10 h of centrifuging. The progressive melting contributes only to the increase of Fe₇₀S₃₀ droplet size, in agreement with *Yoshino & Watson (2005)*. In conductivity experiments, during the 1st heating cycle, the initially high conductivity of peridotite+Fe₇₀S₃₀ drops for 1-1.5 orders of magnitude within 1h after reaching of Fe₇₀S₃₀ melting. At T<1000° C the activation energy of conductivity is about that of a pure peridotite sample, 2.2 eV. Above the melting point of Fe₇₀S₃₀, the activation energy increases to 2.35 eV, and, then, drops to 0.6-0.7 eV, when the peridotite melting is started. In contradiction to *Yoshino et al. (2004)*, the conductivity measurements show that 5-15 vol% Fe₇₀S₃₀ melts never built an interconnected pattern.

DE: 1015 Composition of the core

DE:

1212 Earth's interior: composition and state (7207, 7208, 8105, 8124)

DE: 1507 Core processes (1213, 8115)

DE: 3914 Electrical properties

DE: 8115 Core processes (1213, 1507)

SC: Mineral and Rock Physics [MR]

MN: 2006 Fall Meeting