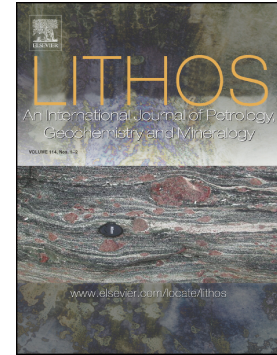


Accepted Manuscript

Three types of element fluxes from metabasite into peridotite in analogue experiments: Insights into subduction-zone processes

A.L. Perchuk, V.O. Yapaskurt, W.L. Griffin, M.Yu. Shur, S.E.M. Gain



PII: S0024-4937(18)30006-9
DOI: <https://doi.org/10.1016/j.lithos.2018.01.002>
Reference: LITHOS 4529

To appear in:

Received date: 29 May 2017
Accepted date: 3 January 2018

Please cite this article as: A.L. Perchuk, V.O. Yapaskurt, W.L. Griffin, M.Yu. Shur, S.E.M. Gain, Three types of element fluxes from metabasite into peridotite in analogue experiments: Insights into subduction-zone processes. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. Lithos(2018), <https://doi.org/10.1016/j.lithos.2018.01.002>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Three types of element fluxes from metabasite into peridotite in analogue experiments: insights into subduction-zone processes

A.L. Perchuk^{1,2,*}, V.O. Yapaskurt¹, W.L. Griffin³, M.Yu. Shur¹, S.E.M. Gain³

¹ *Department of Petrology, Geological Faculty, Moscow State University, Russia*

² *Institute of Experimental Mineralogy, Russian Academy of Sciences, Chernogolovka, Russia*

³ *ARC Centre of Excellence for Core to Crust Fluid Systems/GEMOC, Macquarie University NSW, 2109 Australia*

ABSTRACT

Piston-cylinder experiments with natural rocks and mineral separates were carried out at 750-900 °C and 2.9 GPa, conditions relevant to hot subduction zones, to study the mechanisms of metasomatic alteration of mantle-wedge rocks such as dunite and lherzolite, and the transfer of trace elements released from a carbonate-bearing amphibolite during its eclogitization. Element transfer from the slab to the mantle lithologies occurred in porous-, focused- and diffusive-flow regimes that remove melt and carbon, and partially water, from the metabasite layer. Porous flow is recorded by dissolution of clinopyroxene and growth of orthopyroxene ± garnet ± magnesite ± chlorite along grain boundaries in the peridotite layers, but is invisible in the metabasite layers. Porous flow of the same fluids/melts produces harzburgite mineralogy in both dunite and lherzolite. The transformation of lherzolite to harzburgite reflects breakdown of clinopyroxene in the lherzolite and diffusion of the liberated calcium into the metabasite layer, i.e. against the direction of major fluid/melt flow. Focused flow develops along the side walls of the capsules, producing a melt-free omphacite ± phengite ± quartz paragenesis in the metabasite, and melt segregations, separated from the host peridotite layers by newly-formed omphacite ± garnet ± phlogopite + orthopyroxene + magnesite. Diffusive flow leads to the formation of orthopyroxene ± magnesite ± garnet reaction zones at the metabasite-peridotite interface and some melt-peridotite interfaces.

* Corresponding author.

E-mail address: alp@geol.msu.ru

Download English Version:

<https://daneshyari.com/en/article/8911704>

Download Persian Version:

<https://daneshyari.com/article/8911704>

[Daneshyari.com](https://daneshyari.com)