PAUL SCHERRER INSTITUT

Memorandum

Datum: 15. September 2015
Von J. Tits
Telefon: 4314
Raum: OHLD/001
E-Mail: jan.tits@psi.ch

An: siehe Verteiler

cc:

Einladung zu einem ausserordentlichen LES Palaver

Ich lade Sie herzlich ein.

Referentin: Dina Klimentyeva, Zürich

Thema: **Microstructures of kimberlites from Kaatronlampi (Finland)**

Zeit: Dienstag, 22. September 2015, 09.00 Uhr

Ort: Sitzungszimmer OHSA/E13

Abstract

Kimberlites pose a variety of intriguing and challenging questions. These hybrid rocks of very deep origin possess a high economic significance as a source of diamonds and have received a lot of attention, yet their origin still remains poorly constrained. The presentation will cover some questions of compositional evolution of kimberlitic melt based on the example of kimberlites from Kaavi-Kuopio field in Finland. In particular, the problem of atoll spinel formation will be addressed based on the results from the combination of electron microprobe analysis and electron backscatter diffraction techniques. Evidence will be presented to support two main hypotheses of atoll spinel formation, namely resorption of pleonaste and skeletal growth. An example of phase equilibria calculation will be shown, which allows to deduce pressure and temperature conditions for the formation of spinels and olivine. It will be demonstrated how dislocation patterns in olivines differ between kimberlite from a dyke and those from a pipe. An explanation of a peculiar feature of extreme Mg-enrichment in olivine, usually attributed to mantle metasomatism, will be suggested based on modelling the high-temperature alteration between the xenolithic olivine and the liquid. Finally, the limitations of assuming the phase equilibria for kimberlitic rocks will be discussed, and the extent to which the compositional evolution of olivines and spinels can be reproduced by means of phase equilibria modelling.

Freundliche Grüsse

J. Tits