AGU PUBLICATIONS

[G³ – G cubed]

Supporting Information for

[ORIGIN OF PRIMITIVE OCEAN ISLAND BASALTS BY CRUSTAL GABBRO ASSIMILATION AND MULTIPLE RECHARGE OF PLUME-DERIVED MELTS]

[Anastassia Y. Borisova [1,2*], Wendy A. Bohrson [3] and Michel Grégoire[1]]

1Géosciences Environnement Toulouse, Université de Toulouse; UPS OMP- CNRS - IRD, 14 Avenue E. Belin, 31400 Toulouse, France (anastassia.borisova@get.omp.eu)

2Geological Department, Lomonosov Moscow State University, Vorobievu Gory, 119899, Moscow, Russia

3Department of Geological Sciences, Central Washington University, Ellensburg, WA 98926, USA]

Contents of this file

Table S1: Summary of selected characteristics of all Magma Chamber Simulator models

Supporting Information Database (Supporting Database.xlsx): Summary of all Magma Chamber Simulator models

Table S1. Summary of selected characteristics of all Magma Chamber Simulator models

Model	Pressure (GPa)	Wallrock Initial T (°C), Composition, Sample Name	Recharge Magma Characteristics	H_2O, Magma/Recharge Magma (wt. %)	Olivine, Cpx Abundance (cpx/olivine)*
1-9	0.2	Variable initial T, SiO_2 = 44.90, GM92-412 (1-6), =49.10, GM-92-394 (7-9)	No recharge	2 or 3	Cpx dominates over olivine, cpx/olivine = 0.9-8.6
10-14	0.2	895, SiO_2 = 49.10, GM-92-394	One recharge event, variable masses (50 to 100 grams each)**	2	Cpx dominate, cpx/olivine = 1.3-36
15	0.2	750, SiO_2 = 39.98, GM 139	One recharge event, 100 grams each	2	Cpx dominates, cpx/olivine = 4.7
15p	**1.0**	**850, SiO_2 = 39.98, GM 139**	**Four recharge events, 100 grams each**	**3**	**Cpx dominates, opx present, no olivine**
15r	0.2	750, SiO_2 = 39.98, GM 139	Four recharge events, 100 grams each	2	Subequal, cpx/olivine = 0.8
15w* **	**0.2**	**750, SiO_2 = 39.98, GM 139**	**Four recharge events, 100 grams each**	**3**	**Olivine only, no cpx**
16-18	0.2	**895, SiO_2 = 38.59, GM 134**	**One recharge event, 100 grams**	**2**	**cpx/ol = 2.5**
19-21	0.2	895, SiO_2 = 38.59, GM 134	Multiple recharge events (1-5), 100 grams each	2	Subequal, cpx/ol = 0.7-1.2
22	**0.2**	**895, SiO_2 = 38.59,** GM 134	**Four recharge events, 100 grams each**	**2**	**Olivine only, no cpx**
23	0.2	895, SiO_2 = 38.59, GM 134	Three recharge events 100 grams each	2	Olivine dominates, cpx/ol = 0.2
23w	**0.2**	**895, SiO_2 = 38.59,** GM 134	**Three recharge events 100 grams each**	**3**	**Olivine only, no cpx**
24	0.2	895, SiO_2 = 38.59, GM 134	Four recharge events, 100 grams each	2	Olivine only, no cpx

Table S1 (continued)

Model	Pressure (GPa)	Wallrock Initial T (°C), Composition, Sample Name	Recharge Magma Characteristics	H_2O, Magma/Recharge Magma (wt. %)	Olivine, Cpx Abundance (cpx/olivine)*
24w	**0.2**	**895, SiO_2 = 38.59,** GM 134	**Four recharge events, 100 grams each**	**3**	**Olivine only, no cpx**
25-27	0.2	895, SiO_2 = 38.59, GM 134	Multiple recharge events (3-5), 100 grams each	2	Subequal, cpx/ol = 1.5-1.8
28,29,30	0.3	895, SiO_2 = 38.59, GM 134	Four recharge events, 100 grams each	2	Cpx dominates or subequal, cpx/ol = 0.8-2.5
28cor	0.3	895, SiO_2 = 38.59, GM 134	Four recharge events, 100 grams each	3	Olivine only, no cpx
28w	**0.3**	**895, SiO_2 = 38.59,** GM 134	**Four recharge events, 100 grams each**	**3**	**Olivine only, no cpx**
29-30	0.2	895, SiO_2 = 38.59, GM 134	Four recharge events, 75, 50 grams each respectively	2	Cpx dominates, cpx/ol = 1.5-2.5
31-34	0.2	750, SiO_2 = 39.98, GM 139	Multiple recharge events (1-5), 100 grams each	2	Cpx mostly dominates, one case subequal, cpx/ol = 0.9-4.7
34w	**0.2**	**750, SiO_2 = 39.98,** GM 139	**Four recharge events, 100 grams each**	**3**	**Olivine only, no cpx**
35-38	0.2	750, SiO_2 = 45.85, GM 419	Multiple recharge events (1-5), 100 grams each	2	Cpx dominates over olivine or subequal, one case subequal, cpx/ol = 1.0-5.1
38w	**0.2**	**750, SiO_2 = 45.85,** GM 419	**Four recharge events, 100 grams each**	**3**	**Olivine dominates, cpx/ol = 0.1**
39-41	0.2	750, SiO_2 = 45.85, GM 419	Four recharge events, 75, 50, 100 grams each respectively	2	Cpx dominates or subequal, cpx/ol = 1.1-3.1

Table S1 (continued)

Model	Pressure (GPa)	Wallrock Initial T (°C), Composition, Sample Name	Recharge Magma Characteristics	H_2O, Magma/Recharge Magma (wt. %)	Olivine, Cpx Abundance (cpx/olivine)*
42-45	0.2	800, SiO_2 = 47.15, ARC 343	Multiple recharge events (1-5), 100 grams each	2	Cpx dominates or subequal, cpx/ol = 0.6-3.9
45w	**0.2**	**800, SiO_2 = 47.15,** ARC 343	**Four recharge events, 100 grams each**	**3**	**Olivine only, no cpx**
46-48	0.2	800, SiO_2 = 47.15, ARC 343	Four recharge events, 75 grams each	2	Olivine dominates or subequal, cpx/ol = 0.5-1.1
48w	**0.2**	**800, SiO_2 = 47.15,** ARC 343	**Four recharge events, 75 grams each**	**3**	**Olivine dominates, cpx/ol = 0.4**
49-51	0.2	800, SiO_2 = 46.02, DR 6.5	Multiple recharge events (1-5), 100 grams each	2	Cpx dominates or subequal, cpx/ol =0.5-4.2
51w	**0.2**	**800, SiO_2 = 46.02,** DR 6.5	**Four recharge events, 100 grams each**	**3**	**Olivine only, no cpx**
51rw	0.2	800, SiO_2 = 46.02, DR 6.5	Three recharge events, 100 grams each	3	cpx/ol = 0.4
51cor	0.2	800, SiO_2 = 46.02, DR 6.5	Three recharge events, 100 grams each	3	cpx/ol = 0.4
52	0.2	800, SiO_2 = 45.28, MG 14	Four recharge events, 100 grams each	2	cpx/ol = 0.6
52w	**0.2**	**800, SiO_2 = 45.28, MG 14**	**Four recharge events, 100 grams each**	**3**	**Olivine only, no cpx**

*Clinopyroxene (grams)/olivine (grams) ratio, where masses used are final cumulative masses in magma.
**Initial magma mass always 100 grams.
***Bold denotes the runs that have been identified as best-fit. See Tables 2 and 3 for more information