Non-traditional stable isotope behaviors in immiscible silica-melts in a mafic magma chamber

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Supplementary information

Table S1: compiled Fe isotope data for granitoids

A-Type Granitoids				
Sample	**SiO_2**	**$\delta^{57}Fe$**	**2SE**	**Reference**
EV9101	76.80	0.58	0.05	Sossi et al., 2012
CB9092	77.00	0.45	0.05	Sossi et al., 2012
PO9207	76.10	0.38	0.05	Sossi et al., 2012
9108	77.70	0.36	0.05	Sossi et al., 2012
STM-1 (USGS syenite)	59.60	0.20	0.05	Sossi et al., 2012
NSL (peralk. Rhyolite)	75.50	0.44	0.05	Sossi et al., 2012
AC-E	70.35	0.49	0.05	Sossi et al., 2012
82-QC-32C Peralkaline granite	76.00	0.40	0.05	Sossi et al., 2012
Coso #4/7	77.00	0.34	0.05	Sossi et al., 2012
Coso #5/4	76.90	0.46	0.05	Sossi et al., 2012
Coso # 14/3	76.60	0.43	0.05	Sossi et al., 2012
Coso # 20/5	76.40	0.40	0.05	Sossi et al., 2012
Coso # 25/6	76.70	0.31	0.05	Sossi et al., 2012
H1970-8	73.10	0.28	0.05	Sossi et al., 2012
BP9220	75.81	0.30	0.05	Sossi et al., 2012
Granite, Watergums	73.6	0.227	0.034	Telus et al., 2012
Granite, Mumbella	77	0.467	0.032	Telus et al., 2012
L80-44	77.62	0.43	0.05	Foden et al., 2015
M3-86	75.66	0.32	0.03	Foden et al., 2015
M3-79	74.99	0.32	0.04	Foden et al., 2015
M3-53	74.11	0.36	0.06	Foden et al., 2015
6YC-143	76.93	0.31	0.03	Foden et al., 2015
6YC-137	76.88	0.50	0.03	Foden et al., 2015
I-463	75.25	0.35	0.03	Foden et al., 2015
L74-14G	76.85	0.37	0.06	Foden et al., 2015
KW08-15	72.66	0.36	0.05	Foden et al., 2015
KW08-1	75.02	0.25	0.05	Foden et al., 2015
MG3	71.43	0.22	0.01	Foden et al., 2015
JF07-117	74.50	0.29	0.02	Foden et al., 2015
JF07-116	74.42	0.33	0.06	Foden et al., 2015
HS018	62.88	0.36	0.03	Foden et al., 2015
HS020	58.75	0.38	0.05	Foden et al., 2015
194030	68.51	0.44	0.01	Foden et al., 2015
CB-91-4	63.8	0.25	0.06	Zambardi et al., 2014
CB-91-7	55.9	0.12	0.05	Zambardi et al., 2014
CB-91-13	67.5	0.18	0.02	Zambardi et al., 2014

CB-91-21	75.3	0.54	0.06	Zambardi et al., 2014
CB-91-32	71.5	0.45	0.09	Zambardi et al., 2014
CB-91-48	61.8	0.1	0.04	Zambardi et al., 2014
CB-91-DI5	58.3	0.13	0.05	Zambardi et al., 2014
CB-91-DI1R	73.2	0.34	0.04	Zambardi et al., 2014
BSB-01(BSB)	76.2	0.62	0.06	Zambardi et al., 2014
AC1-016	75.05	0.48	0.06	Zambardi et al., 2014
AC1-79	69.93	0.3	0.06	Zambardi et al., 2014
AC1-134	62.68	0.15	0.06	Zambardi et al., 2014
AC1-178	67.12	−0.09	0.06	Zambardi et al., 2014
I-Type Granitoids				
Sample	**SiO_2**	**$\delta^{57}Fe$**	**2SE**	**Reference**
PC9401	64.90	0.17	0.05	Sossi et al., 2012
Ga	69.90	0.14	0.05	Sossi et al., 2012
GSR-1	72.80	0.24	0.05	Sossi et al., 2012
GRA	62.80	0.08	0.05	Sossi et al., 2012
GS-N (CRPG granite)	65.99	0.18	0.05	Sossi et al., 2012
SEG 03 01 Rhyolite	70.43	0.12	0.05	Sossi et al., 2012
SEG 03 03 Dacitic lava flow	67.88	0.06	0.05	Sossi et al., 2012
SEG 03 43 Rhyodacite	68.66	0.10	0.05	Sossi et al., 2012
SEG 03 44 Dacitic ash flow tuff	64.51	0.01	0.05	Sossi et al., 2012
SB 87 56 Rhyolitic lava flow	70.05	-0.06	0.05	Sossi et al., 2012
SEG 03 31 Rhyolite	71.39	0.10	0.05	Sossi et al., 2012
PU 03 27	66.47	0.07	0.05	Sossi et al., 2012
PU 02 29	69.53	0.12	0.05	Sossi et al., 2012
K-22 Rhyolite lava, Novarupta dome	76.60	0.15	0.05	Sossi et al., 2012
K-45 Dacite pumice, layer C	64.60	-0.03	0.05	Sossi et al., 2012
Q82J-13 Granite	71.90	0.15	0.05	Sossi et al., 2012
82-QC-44 Granodiorite	65.80	0.13	0.05	Sossi et al., 2012
Q83J-99 Granite	76.91	0.21	0.05	Sossi et al., 2012
Q83J-101 Granodiorite	68.40	0.00	0.05	Sossi et al., 2012
Q82J-9 Porphyry (rhyolite) dike	74.20	0.13	0.05	Sossi et al., 2012
Bona1 -Gdrt	66.30	0.16	0.05	Sossi et al., 2012
Iorio1	62.39	0.15	0.05	Sossi et al., 2012
H5-A	72.70	0.23	0.05	Sossi et al., 2012
H4-5	72.00	0.26	0.05	Sossi et al., 2012
H4-7	72.60	0.21	0.05	Sossi et al., 2012
H4-3	66.30	0.03	0.05	Sossi et al., 2012
H2	68.60	0.15	0.05	Sossi et al., 2012
H3-Haf	69.60	0.15	0.05	Sossi et al., 2012
H1104-A	68.40	0.16	0.05	Sossi et al., 2012

HZ-A	63.90	0.09	0.05	Sossi et al., 2012
Hek-8	64.70	0.08	0.05	Sossi et al., 2012
G97-18	69.79	0.19	0.05	Sossi et al., 2012
G99-22	66.92	0.02	0.05	Sossi et al., 2012
RGM-1	73.40	0.29	0.05	Sossi et al., 2012
GSP-2	66.60	0.23	0.05	Sossi et al., 2012
GBW-7111	59.68	0.16	0.05	Sossi et al., 2012
Tonalite, Tuross Head	60.13	0.184	0.026	Telus et al., 2012
Granodiorite, Yurammie	65.27	0.12	0.038	Telus et al., 2012
Granodiorite, Glenbog	67.39	0.167	0.028	Telus et al., 2012
Adamellite, Wallagaraugh	74.87	0.287	0.03	Telus et al., 2012
Tonalite, Jindabyne	62.29	0.129	0.026	Telus et al., 2012
Qtz. Diorite, Clear Hills	56.2	0.109	0.03	Telus et al., 2012
Adamellite, Eugowra	69.51	0.194	0.041	Telus et al., 2012
Adamellite, Eugowra, Lysterfield	63.73	0.193	0.025	Telus et al., 2012
Dacite, Kadoona	66.17	0.147	0.031	Telus et al., 2012
L81-25	69.39	-0.06	0.07	Foden et al., 2015
BOF	73.18	0.30	0.07	Foden et al., 2015
I-1208	70.58	0.15	0.14	Foden et al., 2015
I-841	73.29	0.24	0.01	Foden et al., 2015
X-37	75.46	0.26	0.05	Foden et al., 2015
I-459	73.85	0.28	0.04	Foden et al., 2015
I-1001	73.88	0.31	0.03	Foden et al., 2015
A1109/5	71.95	0.16	0.02	Foden et al., 2015
A1109/14	62.16	0.13	0.02	Foden et al., 2015
SJF7	68.90	0.17	0.02	Foden et al., 2015
A1109 11	73.66	0.24	0.06	Foden et al., 2015
S-Type Granitoids				
Granodiorite, Cooma	72	0.133	0.034	Telus et al., 2012
Granodiorite, Cowra	67.87	0.114	0.029	Telus et al., 2012
Granodiorite, Jillamatong	67.68	0.15	0.029	Telus et al., 2012
Adamellite, Minnegans	68.72	0.215	0.059	Telus et al., 2012
Granodiorite, Dalgety	68.21	0.182	0.026	Telus et al., 2012
Adamellite, Numbla	73.48	0.185	0.038	Telus et al., 2012
Adamellite, Numbla, Koetong	73.65	0.17	0.032	Telus et al., 2012
Granite, Strathbogie	73.65	0.219	0.025	Telus et al., 2012
Dacite, Hawkins	68.05	0.122	0.03	Telus et al., 2012
L80-59	76.00	0.39	0.03	Foden et al., 2015
I-569	76.71	0.40	0.04	Foden et al., 2015
SS2000-11	76.28	0.16	0.01	Foden et al., 2015
90-PE1	75.04	0.28	0.03	Foden et al., 2015

91-CYH1	72.09	0.37	0.04	Foden et al., 2015
99220043	70.28	0.25	0.05	Foden et al., 2015
2001220071	76.28	0.32	0.01	Foden et al., 2015
99220045	75.18	0.29	0.04	Foden et al., 2015
2001220070	76.12	0.34	0.07	Foden et al., 2015
61692	73.32	0.45	0.02	Foden et al., 2015
137471	70.90	0.29	0.06	Foden et al., 2015
RB001	70.51	0.43	0.01	Foden et al., 2015
RB002	74.49	0.27	0.09	Foden et al., 2015
RB003	71.23	0.29	0.09	Foden et al., 2015
RB004	70.10	0.38	0.07	Foden et al., 2015

Table S2: compiled Mg isotope data for granitoids

A-Type Granitoids				
Sample	**SiO_2**	**$\delta^{26}Mg$**	**SE**	**Reference**
9715-1e	74.1	-0.04	0.11	Li et al., 2010
9717-1	73	-0.1	0.08	Li et al., 2010
9718-1	72.8	-0.08	0.08	Li et al., 2010
9767-1e	77	-0.21	0.11	Li et al., 2010
9801-2e	75.7	0.12	0.09	Li et al., 2010
9832-2	76.3	-0.18	0.06	Li et al., 2010
9849-1	74.4	0.01	0.1	Li et al., 2010
DW-2	72.9	0.28	0.1	Li et al., 2010
DW-3	74.5	0.18	0.07	Li et al., 2010
9757-3e	75.9	-0.18	0.09	Li et al., 2010
9757-4	76.2	-0.12	0.08	Li et al., 2010
9780-1e	76.2	0.17	0.09	Li et al., 2010
9781-1e	76.3	0.27	0.09	Li et al., 2010
9781-4e	75.8	0.34	0.09	Li et al., 2010
9781-5e	76.8	0.18	0.09	Li et al., 2010
9782-1e	76.6	-0.01	0.09	Li et al., 2010
Baishi-1	76.1	-0.12	0.06	Li et al., 2010
9843-1	74.9	-0.1	0.07	Li et al., 2010
9843-6e	75.7	-0.28	0.09	Li et al., 2010
A1	73.6	-0.21	0.092	Telus et al., 2012
A2	77	0.026	0.092	Telus et al., 2012
I-Type Granitoids				
MG14	67.2	-0.15	0.09	Li et al., 2010

MG20	74.9	-0.24	0.09	Li et al., 2010
AB40	68.8	-0.18	0.09	Li et al., 2010
AB105	67.9	-0.17	0.09	Li et al., 2010
AB128	64.5	-0.24	0.06	Li et al., 2010
AB249	66.2	-0.16	0.09	Li et al., 2010
AB289	73.8	-0.21	0.08	Li et al., 2010
AB293	63.6	-0.2	0.07	Li et al., 2010
I4	74.87	-0.446	0.092	Telus et al., 2012
I8	63.73	-0.216	0.092	Telus et al., 2012
07LD-1	69.2	-0.26	0.04	Liu et al., 2010
07LD-2	68.5	-0.22	0.05	Liu et al., 2010
07ZB-1	68.6	-0.15	0.04	Liu et al., 2010
07ZB-6	65.6	-0.18	0.04	Liu et al., 2010
07FJ-2	70.3	-0.26	0.04	Liu et al., 2010
07FJ-6	68.1	-0.25	0.05	Liu et al., 2010
07DT-3	67.3	-0.2	0.03	Liu et al., 2010
YFD-8	68.7	-0.14	0.03	Liu et al., 2010
07MC-1	65.9	-0.24	0.03	Liu et al., 2010
07MC-3	65.4	-0.22	0.04	Liu et al., 2010
07MC-6	66.8	-0.24	0.04	Liu et al., 2010
S-Type Granitoids				
VB30	66.1	-0.23	0.07	Li et al., 2010
VB98	73.5	-0.14	0.1	Li et al., 2010
S4	68.72	-0.251	0.092	Telus et al., 2012
S6	73.48	-0.201	0.092	Telus et al., 2012
S8	73.65	-0.209	0.092	Telus et al., 2012

Table S3: compiled Si isotope data for granitoids

A-Type Granitoids				
Sample	**SiO_2**	**$\delta^{30}Si$**	**SE**	**Reference**
2001	73.9	-0.13	0.1	Savage et al., 2012
PG-11	75.1	-0.15	0.06	Savage et al., 2012
2000	74.6	-0.19	0.09	Savage et al., 2012
CB-91-4	63.8	-0.22	0.01	Zambardi et al., 2014
CB-91-7	55.9	-0.25	0.02	Zambardi et al., 2014
CB-91-13	67.5	-0.19	0.04	Zambardi et al., 2014
CB-91-21	75.3	-0.14	0.03	Zambardi et al., 2014
CB-91-32	71.5	-0.11	0.04	Zambardi et al., 2014

CB-91-48	61.8	-0.16	0.03	Zambardi et al., 2014
CB-91-DI5	58.3	-0.24	0.03	Zambardi et al., 2014
CB-91-DI1R	73.2	-0.12	0.03	Zambardi et al., 2014
BSB-01(BSB)	76.2	-0.1	0.03	Zambardi et al., 2014
AC1-016	75.05	-0.16	0.04	Zambardi et al., 2014
AC1-79	69.93	-0.19	0.03	Zambardi et al., 2014
AC1-134	62.68	-0.2	0.04	Zambardi et al., 2014
AC1-178	67.12	-0.31	0.04	Zambardi et al., 2014
I-Type Granitoids				
AB006	67.2	-0.18	0.06	Savage et al., 2012
AB082	66.9	-0.21	0.1	Savage et al., 2012
AB102	72.2	-0.18	0.11	Savage et al., 2012
AB195	65.3	-0.19	0.07	Savage et al., 2012
AB234	69.2	-0.24	0.1	Savage et al., 2012
MG58	72.5	-0.14	0.09	Savage et al., 2012
BB10	71.2	-0.18	0.04	Savage et al., 2012
BB21	76.6	-0.15	0.14	Savage et al., 2012
BB87	67.7	-0.25	0.14	Savage et al., 2012
G38	68	-0.14	0.08	Savage et al., 2012
S-Type Granitoids				
BB02	73.5	-0.23	0.14	Savage et al., 2012
BB09	68.2	-0.26	0.14	Savage et al., 2012
BB12	67.4	-0.25	0.04	Savage et al., 2012
BB53	67.8	-0.33	0.15	Savage et al., 2012
BB83	67.4	-0.22	0.13	Savage et al., 2012
VB140	72.5	-0.37	0.07	Savage et al., 2012
NEB247	72.7	-0.11	0.16	Savage et al., 2012

Table S4: compiled Li isotope data for granitoids

A-Type Granitoids				
Sample	**SiO_2**	**δ^7Li**	**SE**	**Reference**
9715-1	74.1	2.8	1	Li et al., 2010
9717-1	73	3.2	1	Li et al., 2010
9718-1	72.8	0.8	1	Li et al., 2010
9767-1	77	0.8	1	Li et al., 2010
9801-2	75.7	6.9	1	Li et al., 2010
9832-2	76.3	3.1	1	Li et al., 2010
9849-1	74.4	5.1	1	Li et al., 2010

DW-2	72.9	-1.8	1	Li et al., 2010
DW-3	74.5	2.9	1	Li et al., 2010
9757-3	75.9	0.7	1	Li et al., 2010
9757-4	76.2	1.2	1	Li et al., 2010
9780-1	76.2	4.6	1	Li et al., 2010
9781-1	76.3	0.7	1	Li et al., 2010
9781-4	75.8	0.5	1	Li et al., 2010
9781-5	76.8	1.5	1	Li et al., 2010
9782-1	76.6	1.7	1	Li et al., 2010
Baishi-1	76.1	2.4	1	Li et al., 2010
9843-1	74.9	1.1	1	Li et al., 2010
9843-6	75.7	3.2	1	Li et al., 2010
JH-10	57.5	3.1	1	Teng et al., 2009
JH-11	58.9	-1.2	1	Teng et al., 2009
JH-13	60.2	0.4	1	Teng et al., 2009
JH-14	56	0.3	1	Teng et al., 2009
JH-15-2	62.6	-1	1	Teng et al., 2009
JH-17-2	61.4	1.8	1	Teng et al., 2009
JH-21	67	2.8	1	Teng et al., 2009
JH-22	59.9	1.7	1	Teng et al., 2009
JH-25	62.9	-3.2	1	Teng et al., 2009
JH-30	60	-2.2	1	Teng et al., 2009
JH-09	70.84	2.1	1	Teng et al., 2009
JH-12	71.33	2.1	1	Teng et al., 2009
JH-15-1	71.16	0.9	1	Teng et al., 2009
JH-17-1	70.49	0.2	1	Teng et al., 2009
JH-26	70.28	1.7	1	Teng et al., 2009
JH-27	69.67	1.8	1	Teng et al., 2009
JH-28	68.9	0.9	1	Teng et al., 2009
JH-29	69.1	2.9	1	Teng et al., 2009
JH-31	66.75	3	1	Teng et al., 2009
I-Type Granitoids				
MG14	67.2	0.3	1.00	Li et al., 2010
MG20	74.9	0.8	1.00	Li et al., 2010
AB40	68.8	-2.5	1.00	Li et al., 2010
AB105	67.9	-2.1	1.00	Li et al., 2010
AB128	64.5	0.1	1.00	Li et al., 2010
AB249	66.2	2.7	1.00	Li et al., 2010
AB289	73.8	1.8	1.00	Li et al., 2010
AB293	63.6	-0.1	1.00	Li et al., 2010
JG-7	70.74	4.7	0.60	2007Marks et al. CG

JG-6	71.517	3.9	0.60	2007Marks et al. CG
JG-5	70.678	4.2	0.60	2007Marks et al. CG
NEB215	61.59	3.6	1.20	2004Bryant et al. TRSE
NEB212	64.63	2	0.20	2004Bryant et al. TRSE
NEB197	68.01	2.5	1.30	2004Bryant et al. TRSE
NEB232	68.74	4	0.30	2004Bryant et al. TRSE
NEB 414	68.5	0.2		2004Bryant et al. TRSE
NEB54	70.64	1.8	0.80	2004Bryant et al. TRSE
NEB200	67.07	0.5		2004Bryant et al. TRSE
MNG432	57.52	2.9	1.20	2004Bryant et al. TRSE
MNG455	66.64	4.3	1.30	2004Bryant et al. TRSE
MNG223	75.3	2.8	1.40	2004Bryant et al. TRSE
NEB482	64.33	2.3	1.10	2004Bryant et al. TRSE
NEB208	70.3	3.1	0.40	2004Bryant et al. TRSE
72056	65.52	2.1	0.40	2004Bryant et al. TRSE
72332	60.48	8.1	0.50	2004Bryant et al. TRSE
72341	64.36	3.3		2004Bryant et al. TRSE
72016	67.85	6.2		2004Bryant et al. TRSE
72009	67.63	4.5	1.80	2004Bryant et al. TRSE
72098	61.74	2.7	0.50	2004Bryant et al. TRSE
72101	55.71	4.8	0.70	2004Bryant et al. TRSE
72151	65.84	3.1	0.20	2004Bryant et al. TRSE
MG14	67.18	0.3	1.00	2004Teng et al., GCA
MG20	74.91	0.8	1.00	2004Teng et al., GCA
AB40	68.77	-2.5	1.00	2004Teng et al., GCA
AB105	67.86	-2.1	1.00	2004Teng et al., GCA
AB128	64.47	0.1	1.00	2004Teng et al., GCA
AB249	66.18	2.7	1.00	2004Teng et al., GCA
AB289	73.79	1.8	1.00	2004Teng et al., GCA
AB293	63.6	-0.1	1.00	2004Teng et al., GCA
S-Type Granitoids				
VB30	66.1	-1.4	1	Li et al., 2010
VB98	73.5	-1.1	1	Li et al., 2010
3-1B	75.06	4	1	2006Teng et al. AM
4-1	71.98	6.3	1	2006Teng et al. AM
1-1	74.72	2.1	1	2006Teng et al. AM
2-1	74.2	0.2	1	2006Teng et al. AM
HP-3B	73.9	1.6	1	2006Teng et al. AM
HP-8 4L		1.1	1	2006Teng et al. AM
HP-8 8L	68.75	0	1	2006Teng et al. AM
HP-20	74.96	2.9	1	2006Teng et al. AM

HP-1	73.78	-3.1	1	2006Teng et al. AM
HP-2	71.7	-2.1	1	2006Teng et al. AM
HP-6	72.89	-1.47	1	2006Teng et al. AM
HP-14	73.2	-1.4	1	2006Teng et al. AM
HP2A	73.8	2.2	1	2006Teng et al. AM
HP10B	74.6	0.3	1	2006Teng et al. AM
HP13A	74.4	2.17	1	2006Teng et al. AM
HP13C	74.4	2.3	1	2006Teng et al. AM
HP14A	72.9	2	1	2006Teng et al. AM
HP17	75.4	-1.08	1	2006Teng et al. AM
HP22	75.2	-0.1	1	2006Teng et al. AM
HP24B	73.1	3.9	1	2006Teng et al. AM
HP30A	69.8	5.49	1	2006Teng et al. AM
HP39A	72.2	6.55	1	2006Teng et al. AM
HP43A	72.6	0.02	1	2006Teng et al. AM
HP44A	72.7	1.05	1	2006Teng et al. AM
HP45B	74.2	0.97	1	2006Teng et al. AM
MNG459	72.46	2.4	1·0	2004Bryant et al. TRSE
MNG419	69.52	2.4	1·0	2004Bryant et al. TRSE
NEB247	72.66	1.5	0·2	2004Bryant et al. TRSE
NEB251	73.58	-0.1	0.3	2004Bryant et al. TRSE
NEB246	70.42	2.8	0·6	2004Bryant et al. TRSE
NEB219	73.35	2.7	1·1	2004Bryant et al. TRSE
NEB290	68.71	1.2	0·6	2004Bryant et al. TRSE
NEB294	69.51	1.9	2·6	2004Bryant et al. TRSE
NEB484	66.87	0.9	0·8	2004Bryant et al. TRSE
NEB475	67.95	0.5	0·6	2004Bryant et al. TRSE
NEB 415	66.53	0.9	1·3	2004Bryant et al. TRSE
VB30	66.06	-1.4	1	2004Teng et al., GCA
VB98	73.49	-1.1	1	2004Teng et al., GCA

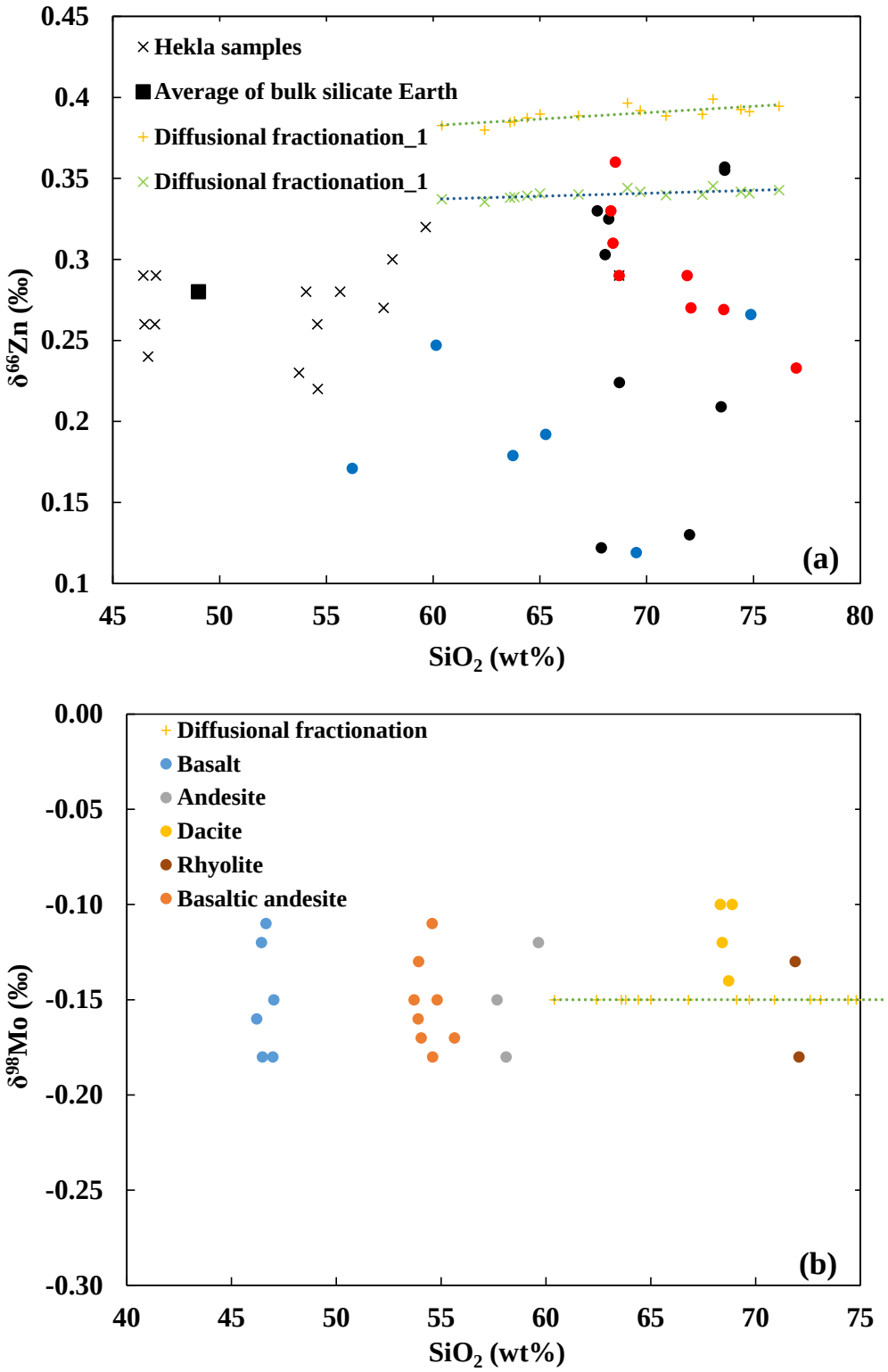

Fig. S1 : Observed and predicted stable isotope compositions of granitoids. (a) Zn isotopes from Chen et al., 2013 and references. The diffusional fractionation trend is calculated using Eq. (9). (b) Mo isotopes from Yang et al., 2015. The diffusional fractionation trend is calculated using Eq. (9).