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(*Received* 2015 *accepted* 2016 *first published online* 2016)

Ab ac

~400 ... ~ 5 ... ε (*t*) (13 20) ... δ (+5.3 ‰) ...

1. I c

... (... *et al.* 200 ... & ... 200 ... *et al.* 2012 ... *et al.* 2012, 2013 ... *et al.* 2013), ... 1 ... *et al.* 200 ... *et al.* 200 a). ... 1 ... 1 ... 3 ... *et al.* 2000 ... & ... 2003 ... *et al.* 200 ... 2014). ... & ... (2011) ... (2014) ...

...), ... & ... 2000 ... 1 ... 3 ... *et al.* 2002 ... *et al.* 2004, 200 a) ... 1). ... (*et al.* 200 d,b ... & ... 2012). ... 1 ... 3 ... *et al.* 2003 ... *et al.* 2003 ... *et al.* 200 a) ... 1). ...

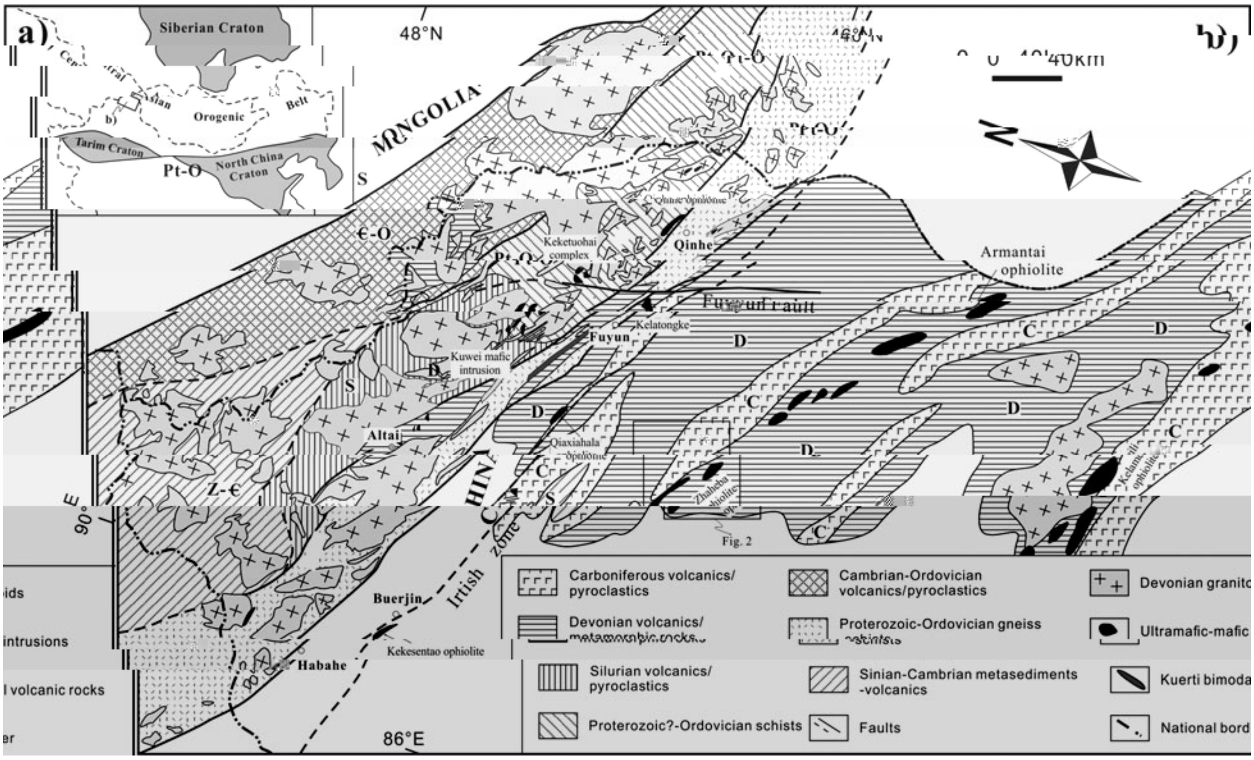


Fig. 1. (a) ... (b) ... et al. 200[illegible]).

... > [illegible]0% ... (Fig. 3 ...). ... et al. 2013). ... (1) ... (2) ... (40–[illegible]0%) ... (30–50%) ... (5–10%) ... (Fig. 3).

2. R[illegible] a[illegible], b[illegible] a[illegible] a[illegible]

... (Figs 1, 2). ... (Fig. 3). ... 15 ... (Fig. 2, ...) ... et al. 2006). ... (Fig. 2). ... (Figs 1–3).

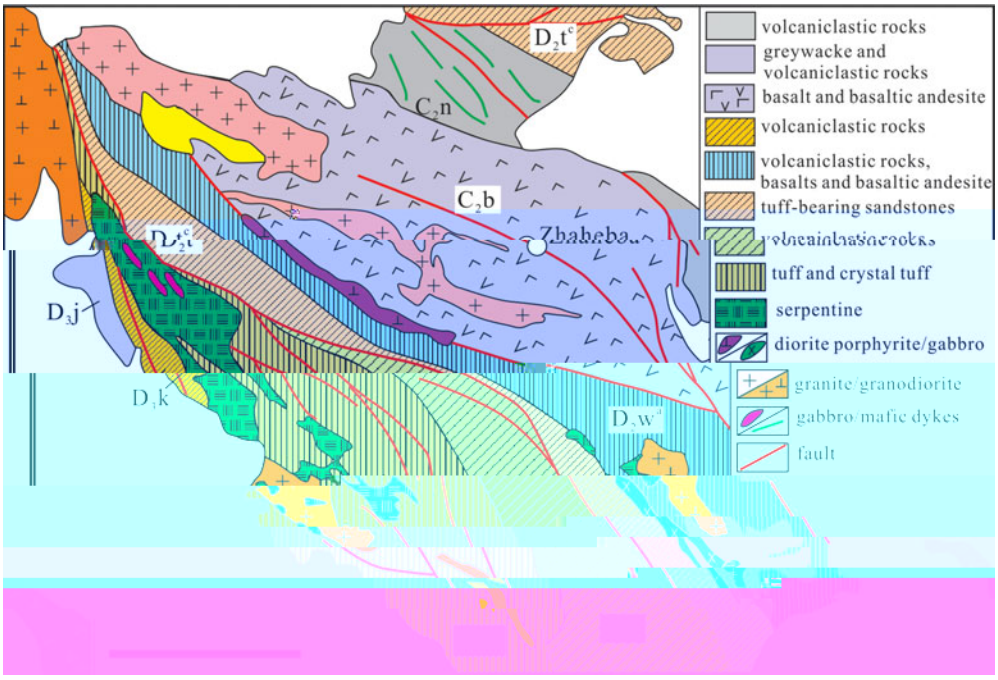


Fig. 2. [illegible] *et al.* 200 [illegible]

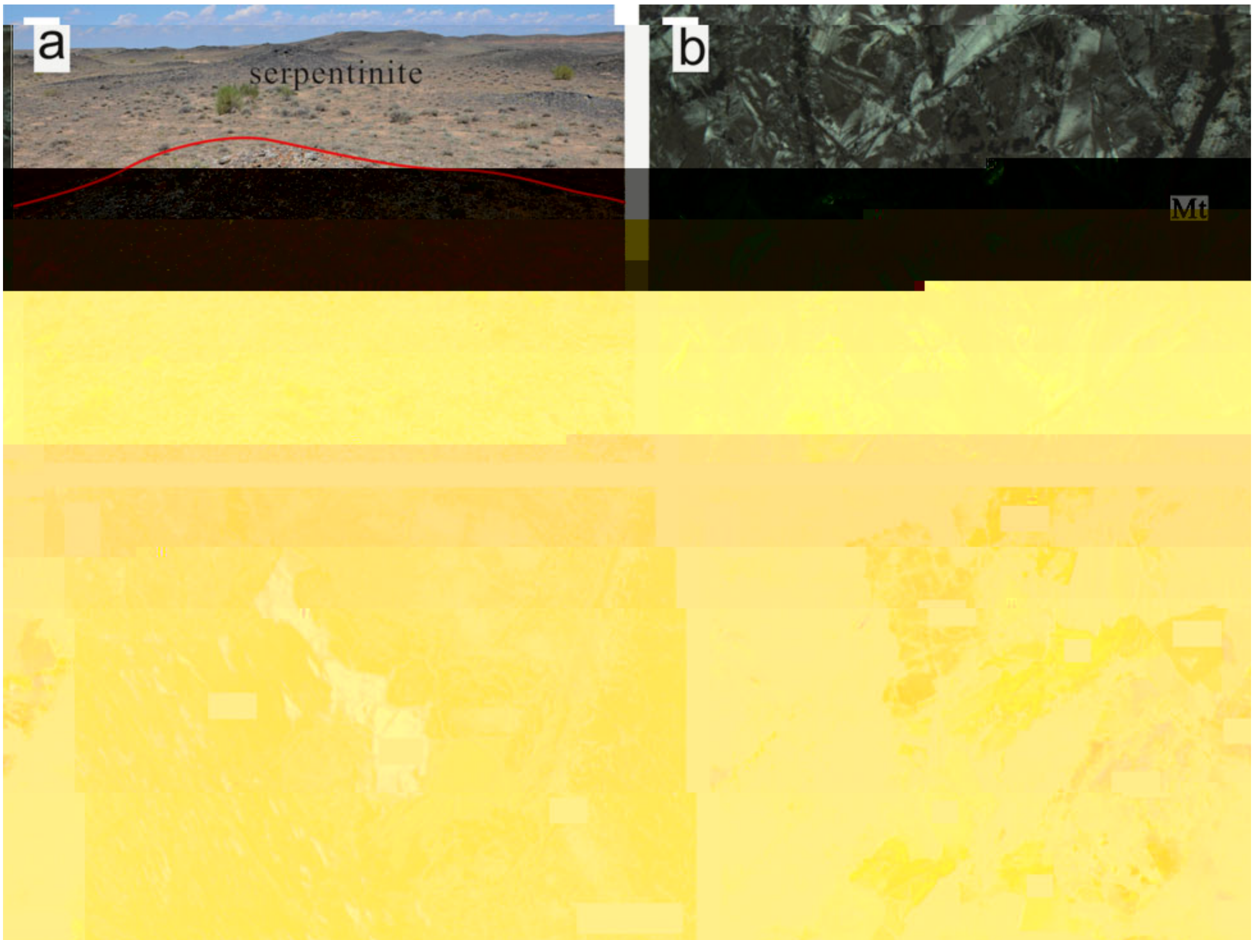


Fig. 3. [illegible]

3. A a ca c

3.a. Z c U Pb a a H O a a

(2013 01, 46° 32′ 51″ … ° 2′ 4″ …) (2013 02, 46° 33′ 2″ … ° 2′ 36″ …)

… *et al.* (2011) … *et al.* 2010) … 2003) … 5 % … 1 … 2, … 10 … 0 … *et al.* (2010*a*) … = 0.0020052) … δ … 5.31 ‰ … *et al.* 2010*b*) … δ … 5.44 ± 0.21 ‰ (2…), … 5.4 ± 0.2 ‰ (… *et al.* 2013) … 3 …

3.b. M a a a

… 00 … 15 … 15 …

… 20 … 4 … 5 …

3.c. W - c a a

… 100 … *et al.* (2004) … 2 %. … 6000 … *et al.* (2004) … 50 … 3 … 1, … -2 … -2, … -1 … 3, … 3. 5%. … 1.

… 3 … *et al.* (2004) … 143 … /144 … = 0.11 4 … 146 … /144 … = 0. 21 … 0. 10 … 0. 0506 … -1, … 143 … /144 … 0.512104 … 0.5126 … -1. … 2.

4. A a ca

4.a. Z c U Pb a

… 100 … 150 μ … 1 1 … 2 1. … (… 4). … (22 123 …) … 5 … 0.4 … 30 … ± 2.5 …

Table 1. [illegible]

[illegible]	2013[illegible]01-1 [illegible]	2013[illegible]01-3	20132[illegible]01-4 [illegible]	2013[illegible]01-5 [illegible]	2013[illegible]01-6 [illegible]	2013[illegible]01-[illegible] [illegible]	2013[illegible]01[illegible] [illegible]	2013[illegible]01[illegible]1	2013[illegible]01[illegible]2	2013[illegible]01[illegible]4
					Major elements (%)					
[illegible] 2	[illegible].[illegible]0	[illegible].20	3[illegible].41	[illegible].62	3[illegible].22	3[illegible]2	3[illegible].05	4[illegible].22	46.[illegible]	51.2
[illegible] 2	0.05	0.20	0.05	0.05	0.04	0.05	0.04	0.14	0.12	0.2
[illegible] 3	0.61	1,[illegible]6	1.04	0.6	0,[illegible]0	0.[illegible]4	0,[illegible]0	[illegible].[illegible]	1[illegible].64	1[illegible].33
[illegible] 3	[illegible].44	4.[illegible]	[illegible]	[illegible].36	[illegible].5	[illegible].16	[illegible]4	3.6	3.24	[illegible]
[illegible]	0.[illegible]	0.10	0.11	0.11	0.11	0.0[illegible]	0.11	0.[illegible]	0.0	0.[illegible]
[illegible]	[illegible].21	24.5[illegible]	[illegible]2	3[illegible]	3[illegible].0[illegible]	3[illegible].31	[illegible].44	10.04	[illegible].03	[illegible]

[illegible] 1. [illegible]

[illegible]	2013[illegible]01-1 [illegible]	2013[illegible]01-3	2013[illegible]01-4 [illegible]	2013[illegible]01-5 [illegible]	2013[illegible]01-6 [illegible]	2013[illegible]01- [illegible]	2013[illegible]01[illegible] [illegible]	2013[illegible]01[illegible] 1	2013[illegible]01[illegible] 2	2013[illegible]01[illegible] 4
[illegible]	0.005	0.064	0.0[illegible]	0.005	0.00	0.003	0.003	0.051	0.044	0.222
[illegible]	0.021	0.34	0.044	0.042	0.0 2	0.031	0.033	0.310	0.25	1.450
[illegible]	0.004	0.04	0.00	0.0[illegible]	0.011	0.005	0.005	0.04	0.043	0.21
[illegible]	0.011	0.232	0.036	0.044	0.012	0.034	0.0[illegible]	0.123	0.0 0	0, 3
[illegible]	0.0 0	0.036	0.0[illegible]	0.03	0.0[illegible]	0.026	0.025	0.046	0.031	0.06
[illegible]	0.2[illegible]	1. 10	6.600	[illegible] 0	0, 3	0.233	1.150	1.5 0	0.516	0.1 5
[illegible]	0.406	0.0 2	0.12	0.112	0.0	0.1	0.054	0.1[illegible]	0.1 1	0.6 5
[illegible]	0.046	0.034	0.014	0.0[illegible]	0.050	0.030	0.010	0.050	0.02	0.130
[illegible]	0.1 1	0.144	0.203	0.364	0.042	0.0 4	0.0	0.066	0.042	0.0 3

[illegible]	2013[illegible]01[illegible] 5	2013[illegible]01[illegible] 6	2013[illegible]01 (1)	2013[illegible]01[illegible] (1)	2013[illegible]01 (1)	2013[illegible]03 2 (1)	2013[illegible]03 3 (1)	2013[illegible]03 4 (1)	2013[illegible]03 5 (1)	2013[illegible]01 3 (2)
					Major elements (%)					
[illegible] 2	4 .1	4[illegible]	[illegible] .	53.1	51, 1	50.40	50.54	50.52	51.22	52.3
[illegible] 2	0.34	0.15	1.40	1.24	1.31	1. 0	1.63	1.31	1.1	0.33
[illegible] 3	[illegible]	1 .[illegible]	16.5	16.1	15, 3	1[illegible]	16. 6	15.55	15.[illegible]	1 .61
[illegible] 3	4.52	3.34	[illegible]	.11	.43	.0	.50	.42	[illegible] 2	3.44
[illegible]	0.0	0.[illegible]	0.11	0.10	0.11	0.13	0.11	0.14	0.12	0.0
[illegible]	[illegible]	.42	4[illegible] 0	4.[illegible]	4.41	[illegible]	3.2	6.06	.14	4[illegible]
[illegible]	11.03	12.61	6.22	5. 5	6.3	6. 5	4.52	.4	[illegible] .26	[illegible] , 0
[illegible]	4[illegible] 6	.[illegible]	[illegible] . 2	[illegible] .3	[illegible] .00	4.52	.31	4[illegible] 0	4.[illegible]	.11
[illegible]	0.13	0.11	0.3	0.31	0.42	2.04	0.33	1.2	2.03	0.1
[illegible] 5	0.04	0.02	0.62	0.62	0.65	0. 4	0.6	0.4	0.44	0.04
[illegible]	3. 2	3.26	4.24	2.54	2, 3	2.2	5.14	2.65	1, 3	2.
[illegible]	. 5	[illegible] 2	. 6	. 0	.4	.40	[illegible] 1	.6	.[illegible]	. 1
[illegible]	4.[illegible]	.4	.11	[illegible] . 0	[illegible] .42	6.56	.64	6.0	6.11	.2
[illegible] #	5	[illegible] 1	55	54	54	56	41	56	64	4
					Trace elements (ppm)					
[illegible]	.0	4, 5	1.16	1.12	1.4	.[illegible]	40.4	5.2	[illegible] 2	5. 1
[illegible]	0.22	0.135	1.[illegible] 4	1.[illegible] 3	1.316	1, 53	1.034	1.100	0.5 5	0.62
[illegible]	25.0	2[illegible]	[illegible] .6	1 .5	1 .5	.5	1 .2	25.2	[illegible]	1 .0
[illegible]	1[illegible]	[illegible] 3.	[illegible] 6	166	1 2	22	22	254	[illegible]	5.
[illegible]	34.	163	60.5	62.6	64.1	116	[illegible]	0.	203	23.
[illegible]	24.2	21.6	26,	23.6	24.6	2[illegible]	[illegible] .5	[illegible] .0	[illegible] .0	16.4
[illegible]	4.	1 5	63.6	50.	51.4	[illegible]	2 .	5 .3	132	1.1
[illegible]	52, 4	55.5	52, 4	55.5 3..3						

1[illegible] (55 0. [illegible] (16. 6)-5[illegible] 51(.0.066)-5[illegible] 45. .05 6 (113.2)-6240. (4[illegible] 25.55)-5[illegible] 4[illegible] 3.2)-5[illegible] 4[illegible] ( )-63[illegible]

[illegible]

[illegible] 1. [illegible]

[illegible]	2013[illegible]01 5	2013[illegible]01 6	2013[illegible]01 (1)	2013[illegible]01 (1)	2013[illegible]01 (1)	2013[illegible]03 2 (1)	2013[illegible]03 3 (1)	2013[illegible]03 4 (1)	2013[illegible]03 5 (1)	2013[illegible]01 3 (2)
[illegible]	3.[illegible]	1.20	3 .60	46. 0	4 .30	23.40	43.00	25.20	32. 0	6.56
[illegible]	.[illegible]	2.6	.50	[illegible] .1 15 0 0 0240 2 0 6.56						

[illegible] 1. [illegible]

[illegible]	2013 [illegible] 01 11 (2)	2013 [illegible] 02 1 (2)	2013 [illegible] 02 2 (2)	2013 [illegible] 03 1 (1)	2013 [illegible] 03 6 (1)	2013 [illegible] 01 10 (2)	04 06 (1)	04 24 (1)	04 2 (1)	03 1 (1)
					Trace elements (ppm)					
[illegible]	1 .4	36,	42.4	26.0	32.4	1 ,	/	/	/	/
[illegible]	0.3 5	0.153	0.3[illegible]	1.1[illegible]	0, 4	0.4[illegible]	/	/	/	/
[illegible]	32.5	33.2	34.5	25.1	26.3	32.1	13.4	20.5	1 .	20.3
[illegible]	1 4	203	21	33	341	1 5	144	[illegible] 4	214	265
[illegible]	56.5	44.2	4[illegible]	1[illegible]	22.2	5[illegible]	1[illegible]	162	214	265
[illegible]	34.	3 .5	[illegible] .3	23.1	2[illegible]	3[illegible]	20.6	30,	[illegible] ,	20.2
[illegible]	66.4	[illegible] 4.6	6.4	25.4	2 .1	66.6	[illegible] .1	114	5.5	.02
[illegible]	6.4	236.4	256.	205.4	2[illegible] ,	114.20	/	/	/	/
[illegible]	[illegible] .0	44.1	4 .0	4,	103	44.1	/	/	/	/
[illegible]	12.0	11.1	11.2	14.	13.6	12.0	/	/	/	/
[illegible]	0.[illegible]	1.420	1.0 0	3.130	3.2 0	0.[illegible] 3	4,	[illegible] .1	22.0	1 .2
[illegible]	1	1 50	5	2 0	24	[illegible] 6	1	[illegible] 31	11[illegible]	6
[illegible]	13.0	13.0	13.2	21.1	22,	12.5	13.2	13.2	14.	20.1
[illegible]	54,	42.3	41.5	144	154	5[illegible]	243	133	164	151
[illegible]	1.2	[illegible] 4	[illegible] 55	11.315	11,[illegible] 5	1.25	20.2	12.	21,	12.2
[illegible]	0.025	0.030	0.02	0.051	0.052	0.0[illegible]	/	/	/	/
[illegible]	0.[illegible] 1	0.[illegible] 6	0.3[illegible]	1.560	1.450	0.360	/	/	/	/
[illegible]	0.[illegible]	1. 20	1.030	0.365	0.406	0.336	/	/	/	/
[illegible]	11	3 2	346	[illegible] 25	50	[illegible] 4.3	/	/	/	/
[illegible]	10. 0	[illegible] 40	.610	26.40	2[illegible] 0	10.50	30.6	32.2	40.1	26.4
[illegible]	23.00	[illegible] , 0	[illegible] .40	51.50	54. 0	22.30	5[illegible]	62,	[illegible] 2.3	52.5
[illegible]	2. 0	2.520	2.510	5. 50	6.[illegible] 0	2.6 0	6,	[illegible] 4	10.5	6.4
[illegible]	1[illegible] 0	11. 0	11.60	22.30	24.30	11.60	2 .5	31.2	43.1	24.4
[illegible]	2.540	2. 00	2.6 0	4.4 0	4. 00	2.3 0	4.5	5.[illegible]	[illegible]	[illegible] 5
[illegible]	[illegible] 6	0, [illegible]	0, 0	1.163	1.25	[illegible] 3	1.45	1.[illegible]	2.0	1.03
[illegible]	2.[illegible] 0	[illegible] 13	2. 54	4.14	4.46	2.522	3.56	4.01	5.35	4.23
[illegible]	0.3 6	0.[illegible]	0.3	0.612	0.660	0.[illegible] 4	0.4	0.54	0.64	0.63
[illegible]	2.[illegible] 0	2.150	2.220	3.420	3.[illegible] 0	2.130	2.5	2.	3.24	3. 5
[illegible]	0.4[illegible]	0.446	0.444	0. [illegible]	0. 5	0.4[illegible]	0.4	0.52	0.5	0.[illegible]
[illegible]	1.350	1.230	1.240	2.120	2.2 0	1.310	1.32	1.3	1.45	2.25
[illegible]	0.1 0	0.16	0.1 5	0.304	0.3[illegible]	0.1 4	0.1	0.2	0.2	0.34
[illegible]	1.210	1.050	1.120	1, 60	2.110	1.210	1.25	1.23	1.24	2.13
[illegible]	0.1 4	0.164	0.165	0.2 1	0.323	0.1 3	0.20	0.1	0.1	0.34
[illegible]	1.3 0	0, 41	1.040	3.2 0	3.510	1.460	5.3	3.2	4.16	3. 2
[illegible]	0.[illegible] 4	0.062	0.051	0.5	0.644	0.0	1.35	0.[illegible]	1.16	0.[illegible]
[illegible]	0.151	2.0	1.50	2. 5	[illegible]	0.33	/	/	/	/
[illegible]	0.3 4	0.206	0.200	45.20	35.10	0.41	[illegible] .13	[illegible] .0	4.[illegible]	21.06
[illegible]	1, 0	0. 61	0. 1	[illegible] 60	.2 0	1,[illegible] 0	4.50	2.63	3.20	.41
[illegible]	0.500	0.304	0.302	[illegible] 30	3.[illegible] 0	0.501	1.	0.6	1.46	2.5

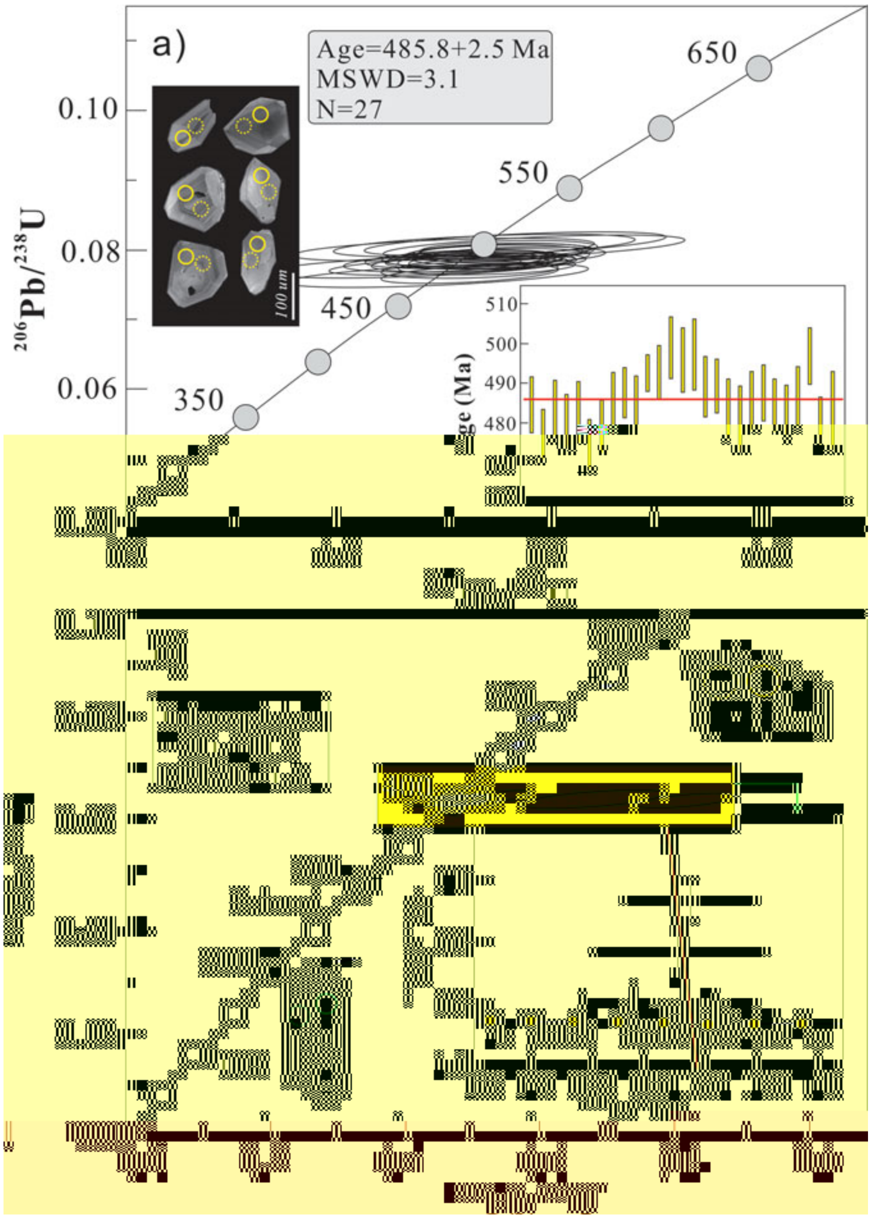
[illegible] 04 06, 04 26, 04 2 [illegible] 04 1 [illegible] *et al.* (200 a). [illegible]

[illegible]

[illegible] 2. [illegible]

[illegible]	[illegible]	[illegible] ( )	[illegible] ( )	[illegible]	[illegible] (1σ)	[illegible]	[illegible] ( )	[illegible] ( )	14[illegible]/144[illegible]	143[illegible]/144[illegible] (1σ)	(143[illegible]/144[illegible])	ε[illegible] (t)
2013[illegible]01 3	[illegible] (2)	0.36	3 2	0.002	0. 04030(2)	0. 04015	2.4	10[illegible]	0.13 4	0.51[illegible] 3 (40)	0.5124 4	6.
2013[illegible]01 10	[illegible] (2)	0.[illegible]	[illegible] 6	0.0024	0. 04 5 (23)	0. 04 45	2.3	11.6	0.1235	0.51[illegible] 0 (43)	0.512[illegible] 6	.1
2013[illegible]03 1	[illegible] (1)	3.13	2 0	0.0335	0. 06324(20)	0. 06133	4.4	22.3	0.121	0.512533(4)	0.512214	[illegible]
2013[illegible]03 2	[illegible] (1)	2[illegible]	1320	0.0063	0. 04[illegible] (20)	0. 04255	4. 5	[illegible] .6	0.1046	0.512 1 (51)	0.512445	6.3
2013[illegible]03 3	[illegible] (1)	[illegible] .06	516	0.0452	0. 053[illegible] (43)	0. 05111	5.	36.	0.0 [illegible]	0.512 0 (30)	0.512450	6.4
2013[illegible]03 4	[illegible] (1)	.65	1[illegible] 0	0.0[illegible]	0. 0422 (51)	0. 04120	4.55	24.5	0.1123	0.51[illegible] 03(53)	0.51250	.5

ε[illegible] (t) = 10 000((143[illegible]/144[illegible])(t)/(143[illegible]/144[illegible]) [illegible] (t) − 1) ε[illegible] (t) [illegible] 401 [illegible]



[illegible] 4. ([illegible]) [illegible] 1σ [illegible] 2σ ([illegible]).

([illegible] 4 [illegible] = 2 [illegible] = 3.1). [illegible] ± 4 [illegible] ([illegible] *et al.* 2003). [illegible] 100 [illegible] 200 μ [illegible]

[illegible] 1 3. [illegible] 1 (1) [illegible] 0 % [illegible] (2) [illegible]

(2, … 4). … 2 … 450 … 500 … 21 … 206 … 20 … 401 ± 2 (… = 3.3) … 206 … 20 … 20 … 235 … 401.4 ± 1.6 (…) (… 206 … 20 … 4), … 1, 3).

4.b. M… a… c…

4.b.1. Spinel composition

(… 3). … 100 … 300 μ… 4 … 3 … 3 … 2 … (100 … /(… + …)) … 44 … 60 … (100 … /(… + …)) … 25 … 61. … *et al.* 2010). … *et al.* 2013).

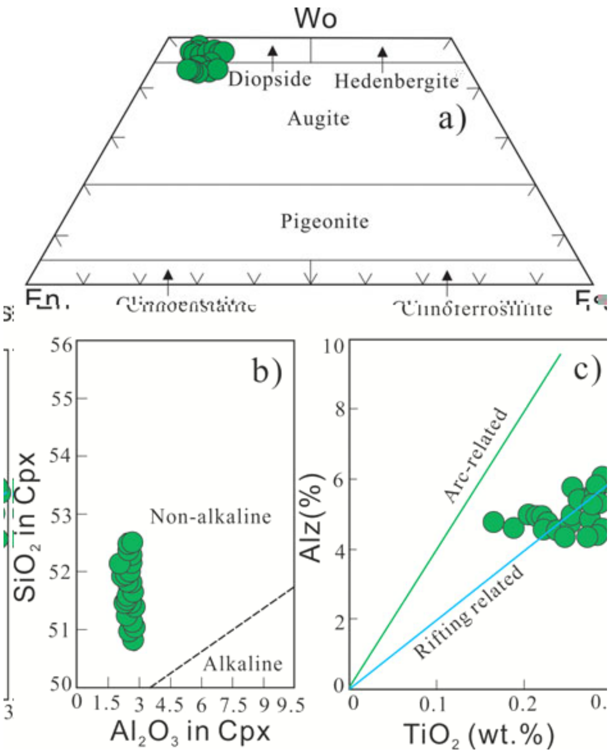
4.b.2. Pyroxene compositions

(… = … 40 6). … 2 … (… 0.5 %) … 5 … 41 4 … 46 55 … 1 … (… 5). … 3 … 2 … 2 … (… 5 …).

4.c. W… c… a… c…

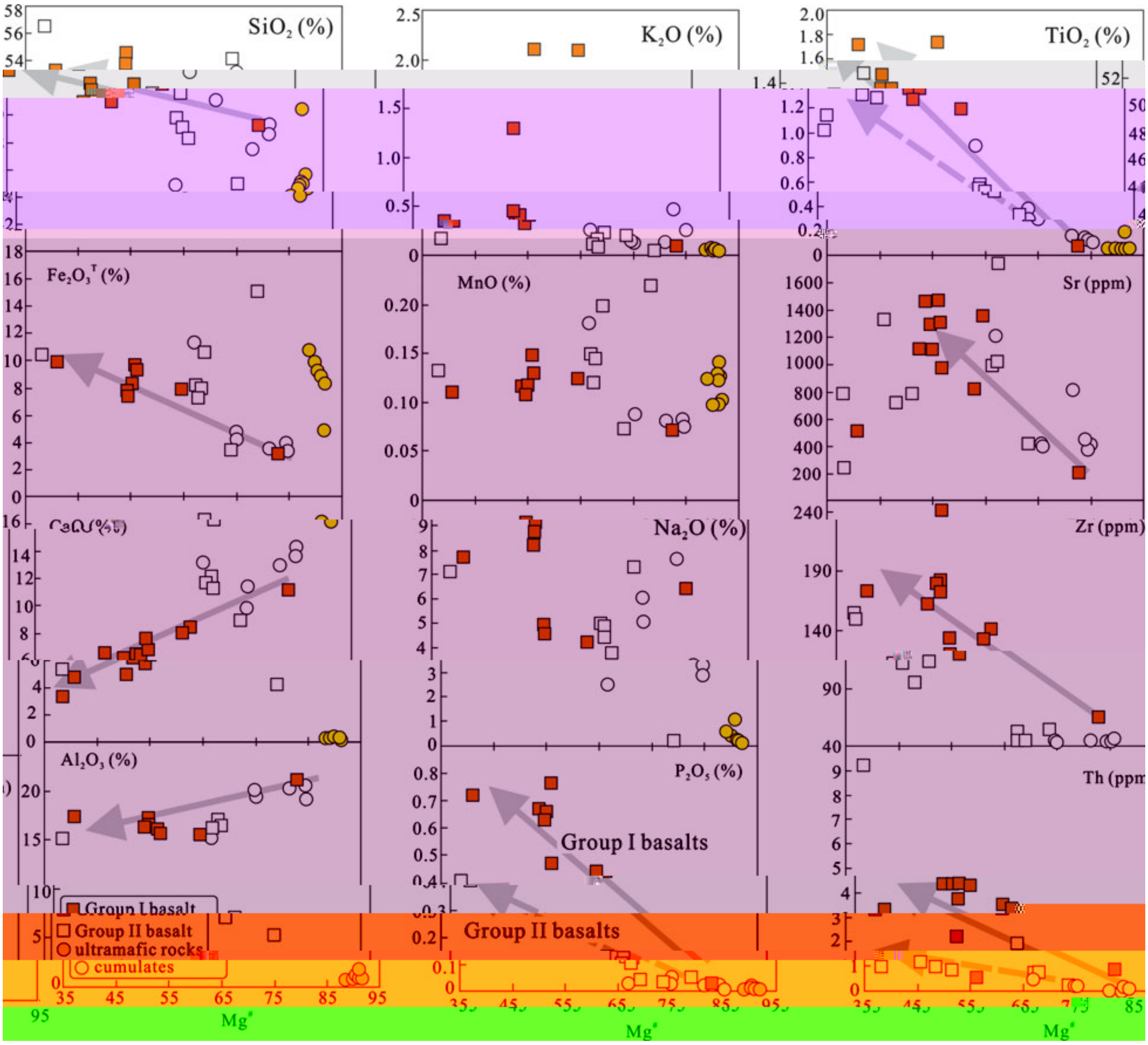
4.c.1. Serpentinites and cumulates

… I) (> 12 %, … 2 (… 40 %), … 3 (… 1.0 %), … (0.03 … 0.06 %), … (0.04 … 0, 2 %) … 2 (0.04 … 0.05 %). … 3 …



… 5. (…) (…) … 2 (… %) … 3 (… %) (…) … 2 (… %)

… 1 (… 1) … (… 6). … (3. 103 … (50 …) (… 1). … (> 12 %) … 3 … 3 … 2, … 1) … 2014 … & … 10). … 2 … 45 … % … 51.2 … %, … 3 (3.24 … 4.0 … %), … 3 (… 3 … 1 … 6 %, … 2013 … 01-3), … (… .54 … 15.42 %), … 2 (0.12 … 0.34 %), … (2, … 1 … %, 2013 … 01-3) … (0.11 … 0.46 %) … (… 1).



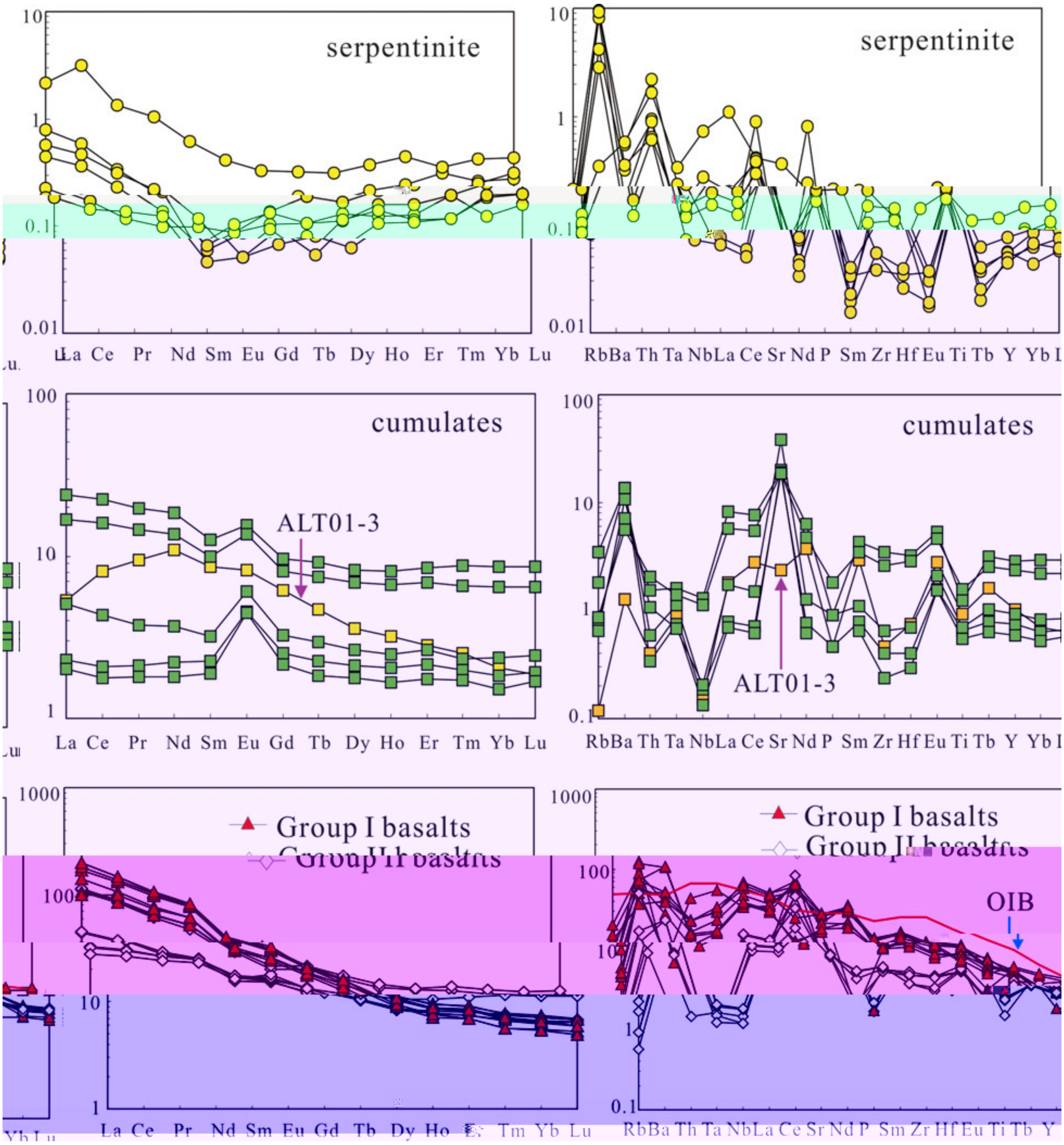
6. *et al.* 200

(Fig. 6). 5 41 = 1.3 2.7 = 1.1 2.2). 2013 01-3 = 0.2 0.4)

4.c.2. Basalts

43.15 % 5 .65 % 52 %,

1) 1 (1) 2 (2). 1 2 (Fig. 6). 124 205 50 60 10 30 (20)

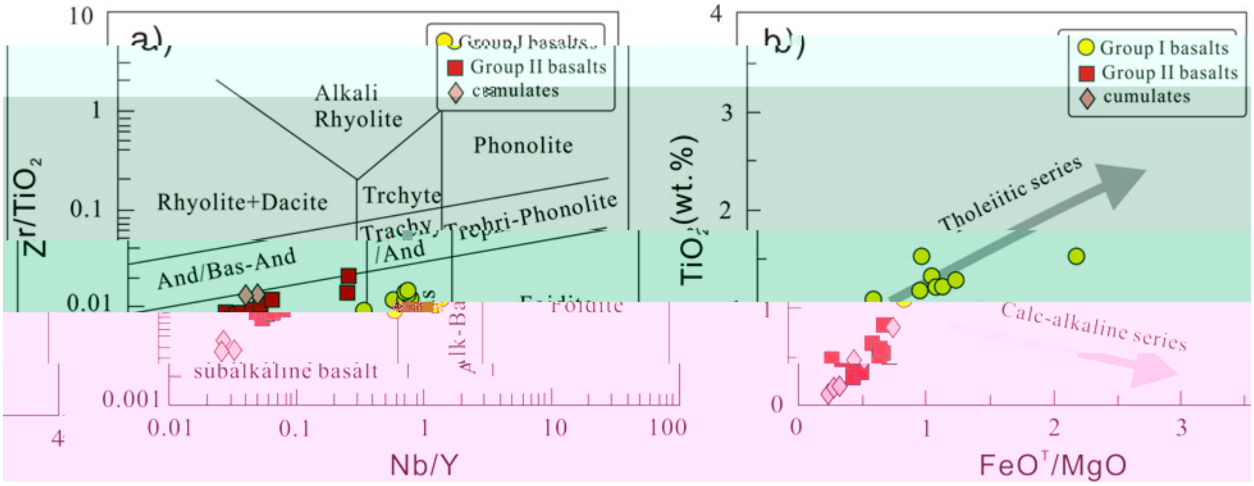


[illegible] (10) [illegible]

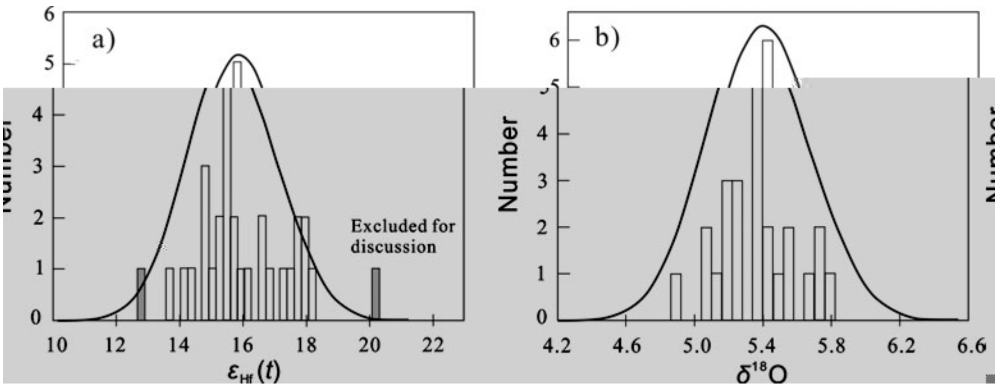
[illegible] = 0.[illegible] 1.14) [illegible] 2.[illegible] 4[illegible] 6[illegible] = 1.02 1.21) [illegible] 1.[illegible] 0.44[illegible] 2.[illegible] 1.[illegible] (~0.11).[illegible]

4. . W [illegible]

[illegible] 2. 1.[illegible] 2.[illegible] (0.0024 0.0452) [illegible] (0. 04030 0. 0530), [illegible] (0. 04015 0. 05111, [illegible] 2013 [illegible] 03 1). [illegible] 0.0[illegible] 0.13 4 [illegible] 0.512 0[illegible] 0.510 3 [illegible] ε (t) [illegible] +6.3 [illegible] + .5 ([illegible] 2013 [illegible] 03 1 [illegible] + [illegible]).



[illegible]



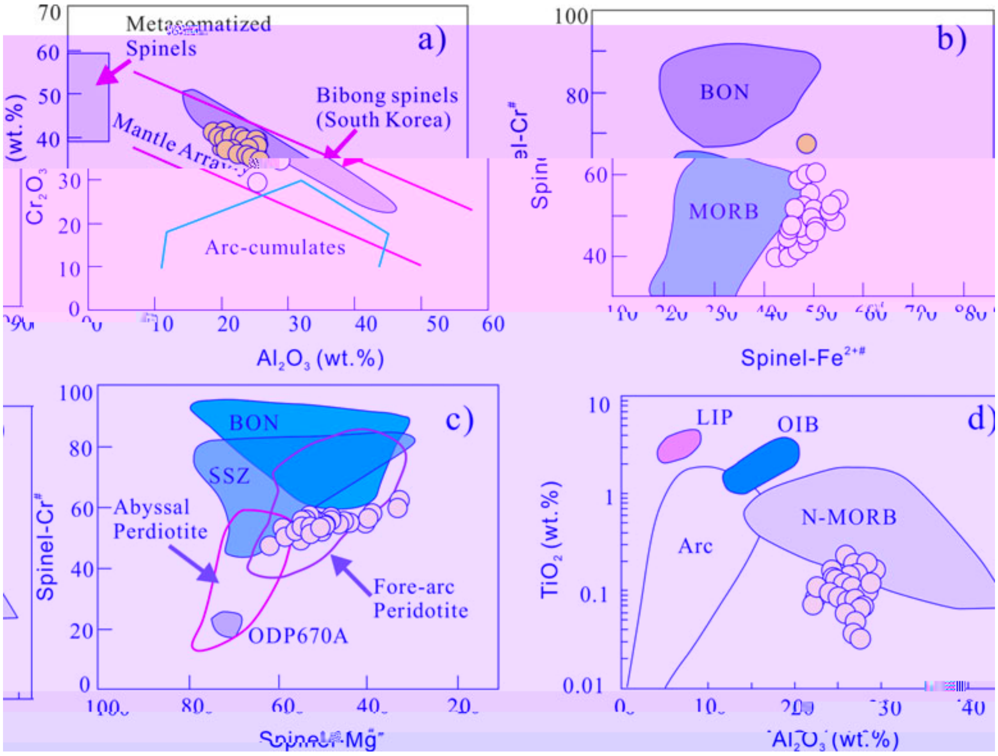
[illegible]

[illegible]

5. D c

5.a. T a b Z a ba

[illegible]

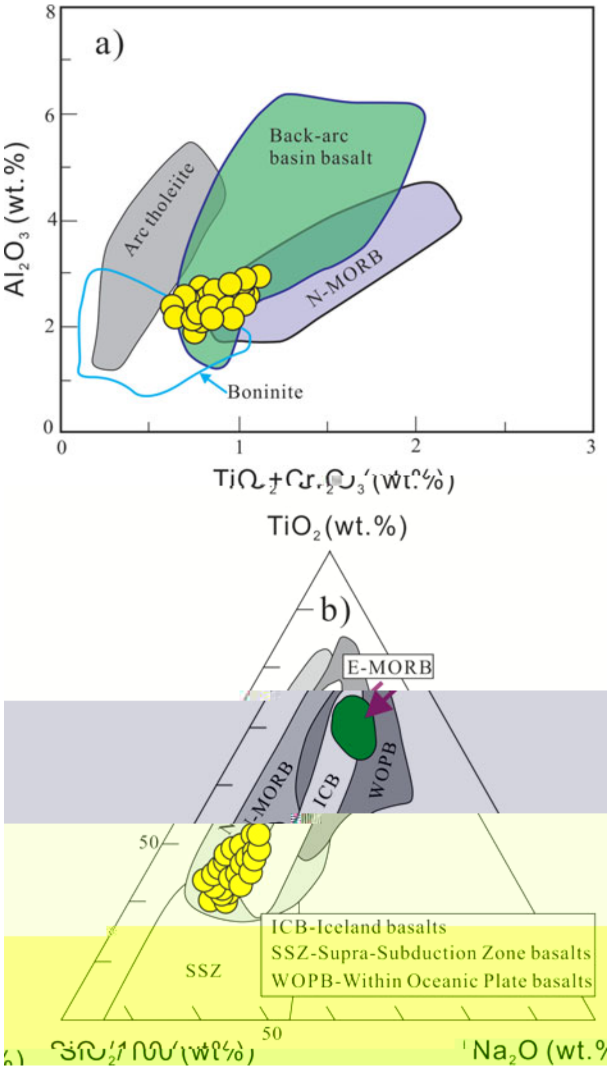


[illegible] 10. ([illegible]) [illegible] (a) [illegible] $_3$ [illegible] $_3$ ([illegible] %) [illegible] & [illegible], 2000). ( ) [illegible] (100 [illegible] /([illegible])) [illegible] $^{2+}$ [illegible] (100 [illegible] $^{2+}$/([illegible] $^{2+}$ + [illegible])) [illegible] 1 [illegible] 4 [illegible] & [illegible], 2001). ( ) [illegible] (100 [illegible] /([illegible] + [illegible])) [illegible] (100 [illegible] /([illegible] + [illegible])) [illegible] *et al.* 1 [illegible] 5). ( ) [illegible] $_2$ [illegible] $_3$ [illegible] & [illegible], 2001). [illegible]

[illegible] (500 [illegible] 0 [illegible]) ([illegible] *et al.* 2003 [illegible] *et al.* 2015 [illegible]), [illegible] (430 [illegible] 400 [illegible]) ([illegible] *et al.* 200 [illegible] b, 2014 [illegible]) [illegible] (3 [illegible] 0 [illegible] 350 [illegible]) ([illegible] *et al.* 2003 [illegible] *et al.* 2006).

5.b. O [illegible] a [illegible] c [illegible] a [illegible]

[illegible] & [illegible], 2002 [illegible] *et al.* 2010 [illegible]



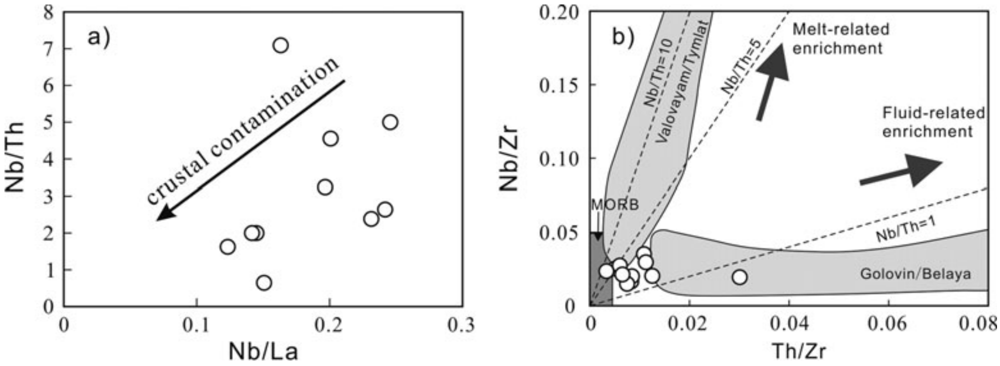
11. ( ) (a) 3 2+ 3 ( ) 2 2/100

). 3 2+ 3 (. 11) 2/100 2 (. 11). (.).

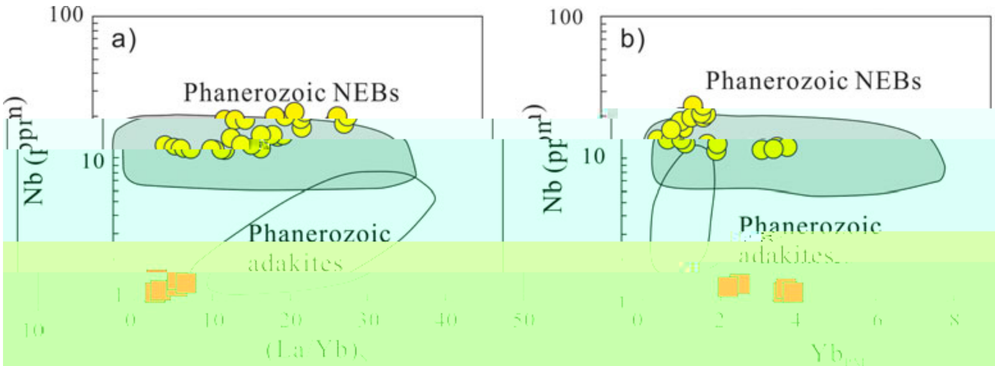
(. 12), (. 12). *et al.* (2002) ( ).

5.c. P D a ba a

2. 1. (11 24 15), 5 (0.4 0.6 %) (11 15, 60) (/ .) ( ) & 1 2 & J , 2001) (. 13). (1) (& , 2002) (2) & 1 2 & , 1 3 *et al.* 1 6). 1. (& , 200 *et al.* 2011) 1 (0. 04120 0. 06133) ε (*t*) (+ + .5). / (3.44 20.4) / (1.51 2.54) (& , 10 6). (*et al.* 1 6 J , 1 6). & J , 2000). & 1 2 *et al.* 1 6). *et al.* (200)



12. [illegible]



13. [illegible]

[illegible] $\varepsilon_{Nd}(t)$ [illegible] (0.704120–0.706133) [illegible]

[illegible] (< 0.3) [illegible] 2002). [illegible] (0.1–1.0) [illegible] (0.1–0.2) [illegible] (0.6–1.0) [illegible]

[illegible] 14). [illegible]

5. [illegible]

[illegible] (416 [illegible] et al. 2014 [illegible] et al. 2015) [illegible] (503 [illegible] et al. 2003 [illegible] et al. 2015 [illegible] (400 [illegible] et al. 2014) [illegible]

[illegible] et al. 200[illegible] a,b [illegible] et al. 200[illegible] a) [illegible] et al. 200[illegible] b). [illegible]

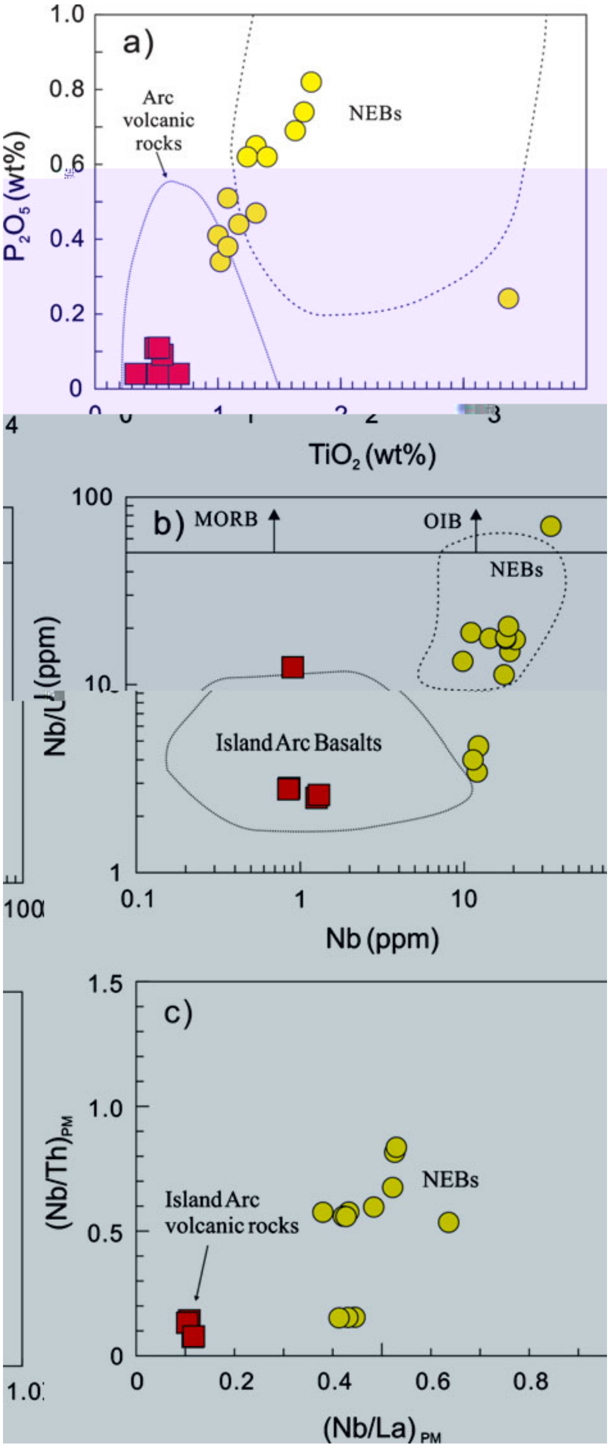


Fig. 14. (...) *et al.* (... 5),

... *et al.* (2015) ...
400 ...

... 460 ... 5 ... *c.* 400 ... *et al.* 2006, 200 ... *et al.* 200 ... *et al.* 200 ... *et al.* 200 , 200 ... *et al.* 2012 ... *et al.* 2015).

... 2002 ... *et al.* 200). ... *et al.* 2015).

... 5.), ... 2 ... 15). ... *et al.* (200 , 200 *b*) ...

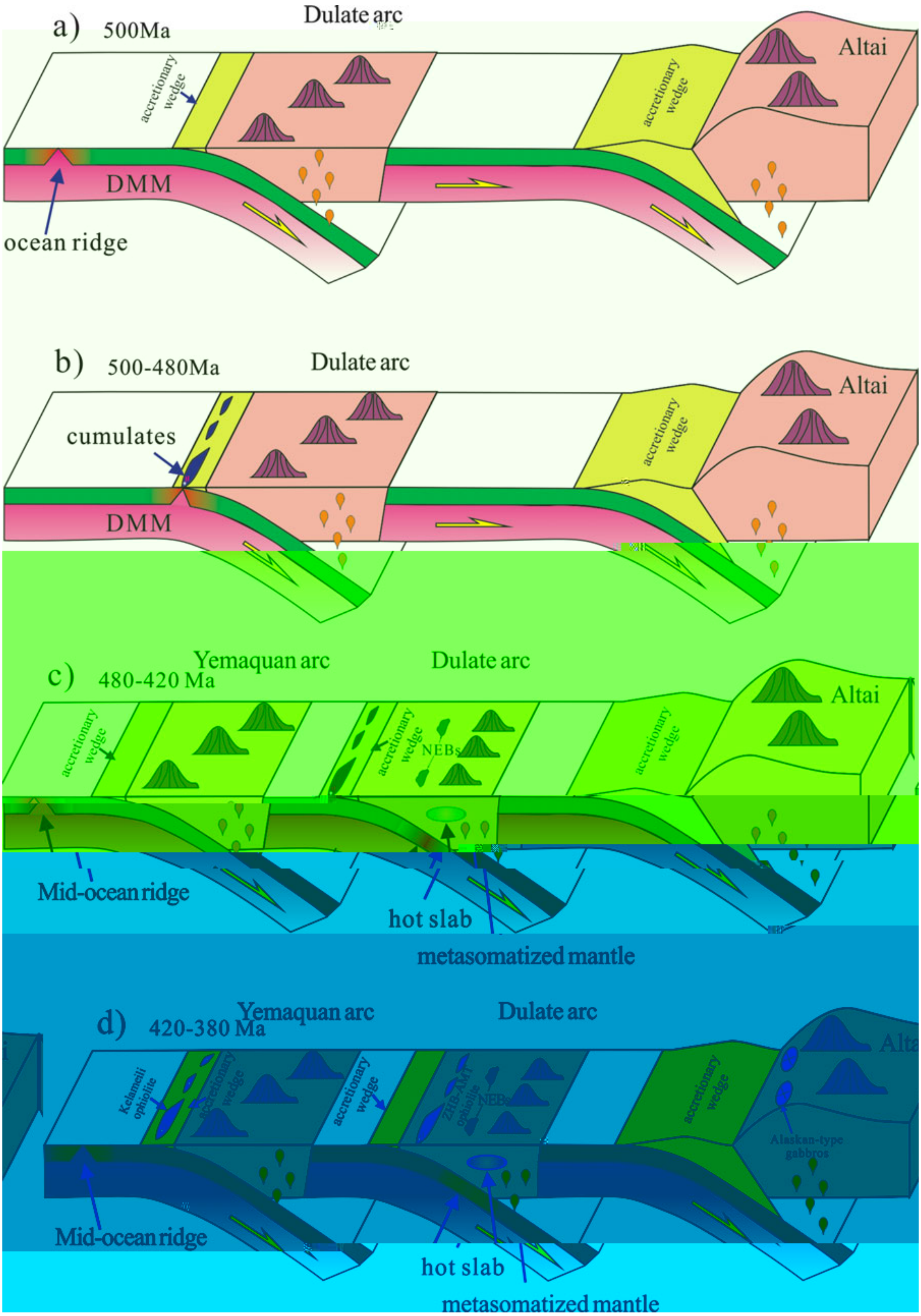
... *et al.* 200). ... & ... 1 ... 1 ... & ... 200 ... *et al.* 2013).

... 15).

(1) ... (*c.* 500), ... 15). ...

(2) ... (500 ... 0 ...), ... 15) ...

(3) ... 0 ... 420), ... (40 ... *et al.* 2015) ... (440 ... *et al.* 2014) ... 15). ...


a)
500Ma
Dulate arc
accretionary wedge
accretionary wedge
Altai
DMM
ocean ridge
b)
500-480Ma
Dulate arc
cumulates
accretionary wedge
Altai
DMM
c)
480-420 Ma
Yemaquan arc
Dulate arc
accretionary wedge
accretionary wedge
NEBs
accretionary wedge
Altai
Mid-ocean ridge
hot slab
metasomatized mantle
d)
420-380 Ma
Yemaquan arc
Dulate arc
Kelameili ophiolite
accretionary wedge
accretionary wedge
ZHB-AMT ophiolite
NEBs
accretionary wedge
Alaskan-type gabbros
Mid-ocean ridge
hot slab
metasomatized mantle

15. ([illegible]) [illegible]

(4) … J … (420 … 0 …) … *et al.* 2014 … *et al.* 2015) … 1 … (…) … 2 … (… 15) … (400 … 0 …) …

6. C … c

(1) … ~ … 5 … *c.* 400 …

(2) …

(3) …

Ac … J … 305 … (2011 … 06 … 03-01).

S … a … a … a

… /10.101 … 0016 … 5 … 16000042.

R … c

… 4. … *Chemical Geology* **113**, 1 … 1 … 204.
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… 200 … *Lithos* **97**, 2 … 1 …
… 2002. … *Geology* **30**, … 0 … 10.
… 200 … *Earth Accretionary Systems in Space and Time* (…), … 1 … 36.
… 3 … 2002. … *Geological Magazine* **139**, 1 … 13.
… 1 … 3. … *Geological Society of America Bulletin* **105**, … 15 … 3 …
… 1 … *Ophiolites.* … 220
… 1 … 3. … *Geology* **21**, 54 … 50.
… 1 … 2. … *Journal of Geological Society, London* **149**, 56 …
… 1 … 4. … *Contributions to Mineralogy and Petrology* **86**, 54 … 6.
… 2003. … (2) … *Ophiolites in Earth History* (…), … 43 … 2 …
… 2011. … *Geological Society of America Bulletin* **123**, … 411.
… 2015. … *Chinese Journal of Geology* **50**, 140 … 54 …).
… 2000. … *Contributions to Mineralogy and Petrology* **140**, … 3 … 5.
… 1 … 1. … *Lithos* **27**, 25 …

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& 1 6). *Journal of Petrology* **37**, 6 3 26.

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& 2012. *Precambrian Research* **192 195**, 1 0 20 .

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& 1 5 *Nature* **377**, 5 5 600.

& 1 3. *Nature* **364**, 2 30.

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& 200 . *Acta Petrologica Sinica* **23**, 1 33 44 ( ).

& 1 . *Contributions to Mineralogy and Petrology* **133**, 1 11.

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& 200 . *Lithos* **110**, 35 2.

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& 1 *Chemical Geology* **20**, 325 43.

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& 2006. *Geology in China* **33**, 4 6 6 ( ).

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& 2013. *Gondwana Research* **23**, 1316 41.

& 2004. *Journal of Geological Society, London* **161**, 33 42.

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[illegible] 200[illegible] *b*. [illegible] *American Journal of Sciences* **309**, 221[illegible] 0.

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[illegible] 200[illegible] *Chemical Geology* **242**, 22[illegible] 3[illegible].

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[illegible] 200[illegible]. [illegible] *Acta Petrologica Sinica* **24**, 1054[illegible] [illegible]).

[illegible] 1[illegible] 6. [illegible] *Annual Review of Earth and Planetary Sciences* **14**, 4[illegible] 3[illegible] 5[illegible] 1.