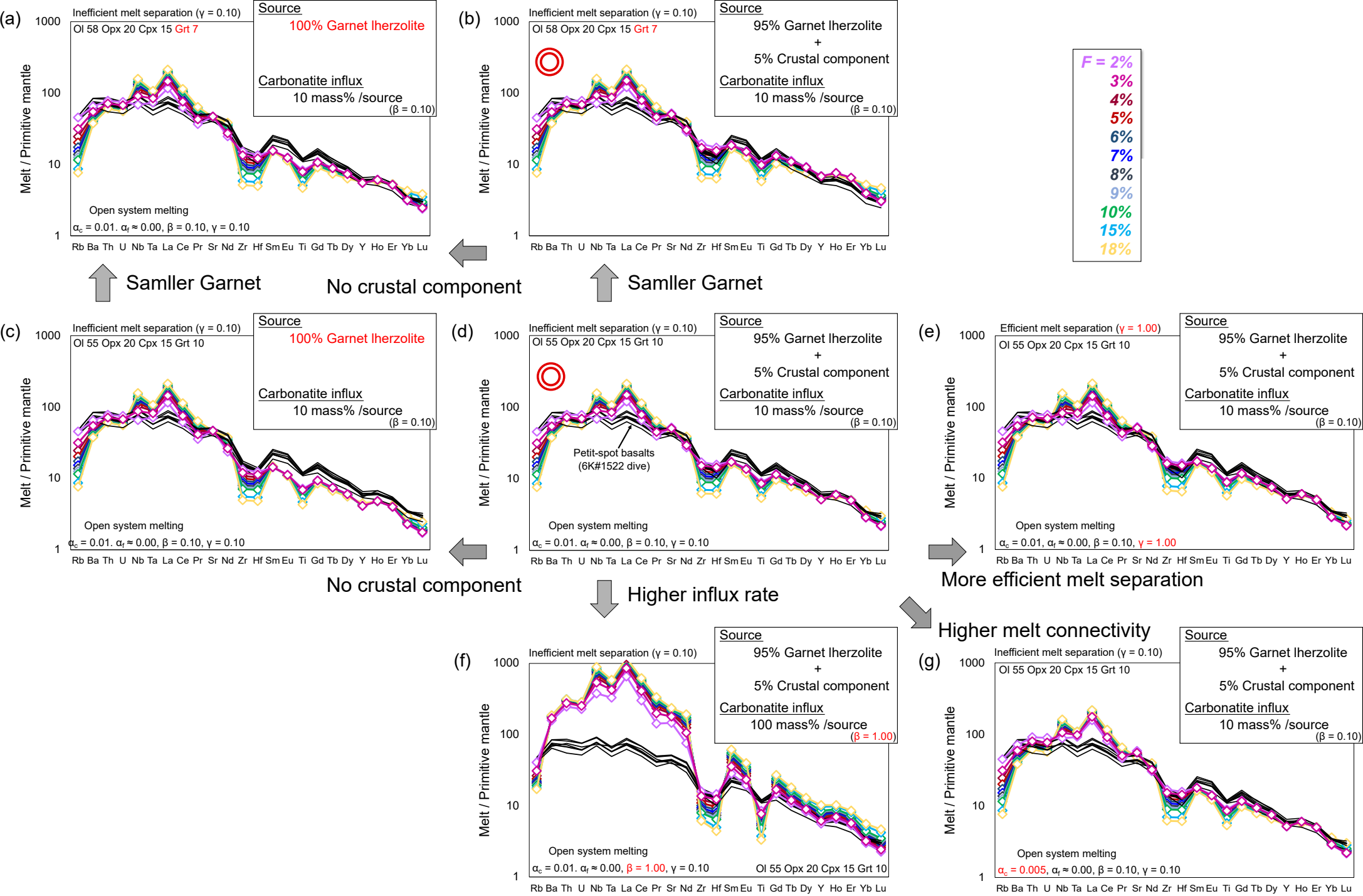
(a)
Inefficient melt separation (γ = 0.10)
Ol 58 Opx 20 Cpx 15 Grt 7
Source
100% Garnet lherzolite
Carbonatite influx
10 mass% /source
(β = 0.10)
Open system melting
αc = 0.01. αf ≈ 0.00, β = 0.10, γ = 0.10
Melt / Primitive mantle
1000
100
10
1
Rb Ba Th U Nb Ta La Ce Pr Sr Nd Zr Hf Sm Eu Ti Gd Tb Dy Y Ho Er Yb Lu
(b)
Inefficient melt separation (γ = 0.10)
Ol 58 Opx 20 Cpx 15 Grt 7
Source
95% Garnet lherzolite
+
5% Crustal component
Carbonatite influx
10 mass% /source
(β = 0.10)
F = 2%
3%
4%
5%
6%
7%
8%
9%
10%
15%
18%
Samller Garnet
No crustal component
Samller Garnet
(c)
Inefficient melt separation (γ = 0.10)
Ol 55 Opx 20 Cpx 15 Grt 10
Source
100% Garnet lherzolite
Carbonatite influx
10 mass% /source
(β = 0.10)
Open system melting
αc = 0.01. αf ≈ 0.00, β = 0.10, γ = 0.10
(d)
Inefficient melt separation (γ = 0.10)
Ol 55 Opx 20 Cpx 15 Grt 10
Source
95% Garnet lherzolite
+
5% Crustal component
Carbonatite influx
10 mass% /source
(β = 0.10)
Petit-spot basalts
(6K#1522 dive)
Open system melting
αc = 0.01. αf ≈ 0.00, β = 0.10, γ = 0.10
(e)
Efficient melt separation (γ = 1.00)
Ol 55 Opx 20 Cpx 15 Grt 10
Source
95% Garnet lherzolite
+
5% Crustal component
Carbonatite influx
10 mass% /source
(β = 0.10)
Open system melting
αc = 0.01, αf ≈ 0.00, β = 0.10, γ = 1.00
No crustal component
Higher influx rate
More efficient melt separation
Higher melt connectivity
(f)
Inefficient melt separation (γ = 0.10)
Source
95% Garnet lherzolite
+
5% Crustal component
Carbonatite influx
100 mass% /source
(β = 1.00)
Open system melting
αc = 0.01. αf ≈ 0.00, β = 1.00, γ = 0.10
Ol 55 Opx 20 Cpx 15 Grt 10
(g)
Inefficient melt separation (γ = 0.10)
Ol 55 Opx 20 Cpx 15 Grt 10
Source
95% Garnet lherzolite
+
5% Crustal component
Carbonatite influx
10 mass% /source
(β = 0.10)
Open system melting
αc = 0.005, αf ≈ 0.00, β = 0.10, γ = 0.10