

Table S1. Microprobe data of orthopyroxene and clinopyroxene neoblasts and porphyroclasts in sample 6.4 and 6.8. In brackets behind the ROI numbers is the amount of measurements. The values shown are the average wt. % with in brackets the standard deviation

6.4	Fine-Grained Neoblasts					Neoblasts	Porphyroclast	6.4	Fine-Grained Neoblasts			Neoblasts	Porphyroclast
opx	ROI14 (5)	ROI 15 (2)	ROI25(8)	ROI25 (16)	ROI25 (12)		cpx	ROI14 (4)	ROI15 (8)	ROI25 (8)	ROI15 (31)	ROI25 (8)	ROI15 (8)
SiO ₂	56.68 (0.54)	56.96 (0.15)	56.32 (0.38)	55.22 (0.5)	54.39 (0.27)		SiO ₂	53.37 (0.38)	53.26 (0.60)	52.99 (0.55)	51.93 (0.78)	51.36 (0.24)	50.85 (0.34)
TiO ₂	0.08 (0.011)	0.096 (0.003)	0.08 (0.01)	0.11 (0.02)	0.13 (0.01)		TiO ₂	0.41 (0.07)	0.40 (0.05)	0.40 (0.07)	0.45 (0.07)	0.51 (0.03)	0.44 (0.01)
Al ₂ O ₃	1.41 (0.44)	1.52 (0.04)	1.66 (0.42)	2.98 (0.61)	4.71 (0.38)		Al ₂ O ₃	3.18 (0.34)	3.59 (0.55)	2.96 (0.57)	5.18 (1.04)	4.98 (0.41)	6.76 (0.15)
Cr ₂ O ₃	0.11 (0.042)	0.12 (0.008)	0.13 (0.04)	0.27 (0.07)	0.56 (0.07)		Cr ₂ O ₃	0.41 (0.07)	0.47 (0.07)	0.38 (0.10)	0.79 (0.19)	0.64 (0.08)	1.04 (0.04)
FeO	6.69 (0.05)	6.59 (0.085)	6.57 (0.14)	6.37 (0.11)	6.25 (0.06)		FeO	2.58 (0.02)	2.53 (0.10)	2.56 (0.14)	2.62 (0.15)	2.69 (0.12)	2.89 (0.12)
MnO	0.17 (0.009)	0.16 (0.015)	0.16 (0.019)	0.15 (0.015)	0.14 (0.02)		MnO	0.095 (0.009)	0.08 (0.01)	0.078 (0.014)	0.09 (0.013)	0.08 (0.01)	0.11 (0.01)
NiO	0.07 (0.013)	0.08 (0.015)	0.08 (0.019)	0.078 (0.014)	0.09 (0.01)		NiO	0.025 (0.012)	0.04 (0.03)	0.036 (0.026)	0.04 (0.02)	0.05 (0.02)	0.05 (0.01)
MgO	34.72 (0.61)	34.38 (0.04)	34.17 (0.33)	33.26 (0.33)	32.40 (0.38)		MgO	16.93 (0.17)	16.69 (0.34)	16.98 (0.58)	15.95 (0.5)	15.89 (0.20)	15.45 (0.44)
CaO	0.37 (0.08)	0.40 (0.01)	0.42 (0.09)	0.61 (0.09)	1.05 (0.40)		CaO	23.02 (0.07)	22.93 (0.22)	22.63 (0.59)	22.46 (0.38)	22.30 (0.23)	22.14 (0.59)
Na ₂ O	0.01 (0.003)	0.01 (0.006)	0.01 (0.003)	0.018 (0.007)	0.038 (0.018)		Na ₂ O	0.63 (0.01)	0.68 (0.04)	0.64 (0.02)	0.78 (0.07)	0.75 (0.05)	0.79 (0.03)
K ₂ O	0.001 (0.001)	0 (0)	0.001 (0.002)	0.001 (0.001)	0.0006 (0.0012)		K ₂ O	0	0.0005 (0.0010)	0.0006 (0.0015)	0.0006 (0.0013)	0.0006 (0.001)	0.0004 (0.0007)
Total	100.31 (0.13)	100.33 (0.27)	99.61 (0.49)	99.07 (0.34)	99.77 (0.32)		Total	100.65 (0.16)	100.68 (0.42)	99.67 (0.39)	100.30 (0.35)	99.25 (0.44)	100.52 (0.45)

6.6	Fine-Grained Neoblasts				Neoblasts	Porphyroclasts				
opx	ROI16 (5)	ROI19 (9)	ROI16 (2)	ROI20 (10)	ROI23 (10)	ROI24 (5)	ROI32 (4)	ROI19 (4)	ROI20 (5)	ROI24 (4)
SiO ₂	56.07 (0.13)	56.25 (0.36)	55.75 (0.05)	55.62 (0.34)	56.06 (0.44)	55.38 (0.61)	56.32 (0.48)	55.34 (0.37)	54.21 (0.34)	53.97 (0.23)
TiO ₂	0.09 (0.01)	0.10 (0.01)	0.105 (0.005)	0.096 (0.016)	0.08 (0.01)	0.10 (0.02)	0.09 (0.01)	0.13 (0.01)	0.14 (0.02)	0.13 (0.01)
Al ₂ O ₃	2.17 (0.31)	2.58 (0.54)	2.99 (0.03)	2.84 (0.27)	1.85 (0.55)	2.77 (0.52)	2.03 (0.35)	4.24 (0.32)	4.79 (0.35)	3.97 (0.32)
Cr ₂ O ₃	0.16 (0.04)	0.22 (0.05)	0.223 (0.001)	0.23 (0.04)	0.14 (0.05)	0.24 (0.09)	0.16 (0.03)	0.44 (0.06)	0.55 (0.06)	0.43 (0.02)
FeO	6.75 (0.13)	6.78 (0.19)	6.85 (0.01)	6.60 (0.19)	6.76 (0.11)	6.65 (0.13)	6.78 (0.08)	6.42 (0.05)	6.32 (0.11)	6.37 (0.05)
MnO	0.15 (0.01)	0.16 (0.01)	0.154 (0.007)	0.16 (0.01)	0.16 (0.01)	0.13 (0.02)	0.16 (0.01)	0.16 (0.02)	0.14 (0.02)	0.144 (0.008)
NiO	0.082 (0.007)	0.07 (0.02)	0.056 (0.005)	0.08 (0.01)	0.068 (0.01)	0.08 (0.03)	0.09 (0.01)	0.09 (0.03)	0.102 (0.007)	0.08 (0.01)
MgO	33.89 (0.22)	34.05 (0.3)	33.69 (0.02)	33.75 (0.25)	33.9 (0.3)	33.38 (0.5)	34.01 (0.25)	33.04 (0.51)	32.41 (0.47)	32.25 (0.22)
CaO	0.46 (0.04)	0.49 (0.09)	0.613 (0.008)	0.49 (0.11)	0.43 (0.08)	0.68 (0.36)	0.46 (0.1)	0.98 (0.45)	1.39 (0.53)	1.25 (0.15)

Na ₂ O	0.012 (0.007)	0.011 (0.004)	0.0154 (0.004)	0.007 (0.006)	0.014 (0.002)	0.02 (0.01)	0.01 (0.01)	0.03(0.02)	0.049 (0.02)	0.04 (0.01)
K ₂ O	0.0004 (0.0003)	0.002 (0.002)	0.0008 (0.0008)	0.001 (0.001)	0.001 (0.002)	0.002 (0.001)	0.0009 (0.0015)	0.001 (0.001)	0.003 (0.001)	0.0005 (0.0007)
Total	99.84 (0.24)	100.71 (0.21)	100.45 (0.02)	99.88 (0.33)	99.46 (0.19)	99.43 (0.26)	100.11 (0.42)	100.89 (0.24)	100.11 (0.1)	98.65 (0.23)

6.6

Porphyroclasts

Neoblastst

Fine-Grained Neoblasts

cpx

ROI16 (4)

ROI33 (6)

ROI16 (10)

ROI20 (5)

ROI32 (9)

ROI33 (9)

ROI16 (4)

ROI19 (7)

ROI23 (6)

SiO ₂	50.35 (0.34)	50.97 (0.15)	51.71 (0.60)	52.03 (0.46)	52.82 (0.27)	52.63 (0.48)	52.40 (0.26)	53.11 (0.40)	52.48 (0.52)
TiO ₂	0.41 (0.02)	0.43 (0.02)	0.42 (0.06)	0.51 (0.11)	0.43 (0.05)	0.42 (0.04)	0.41 (0.04)	0.46 (0.06)	0.44 (0.09)
Al ₂ O ₃	6.34 (0.29)	6.20 (0.18)	5.19 (0.72)	4.75 (0.28)	3.81 (0.33)	4.38 (0.51)	3.93 (0.36)	3.91 (0.56)	3.62 (0.62)
Cr ₂ O ₃	1.03 (0.03)	0.94 (0.05)	0.79 (0.16)	0.54 (0.06)	0.45 (0.06)	0.56 (0.09)	0.47 (0.05)	0.48 (0.11)	0.43 (0.07)
FeO	2.78 (0.07)	2.81 (0.09)	2.62 (0.09)	2.86 (0.06)	2.66 (0.11)	2.64 (0.14)	2.71 (0.03)	2.69 (0.07)	2.69 (0.07)
MnO	0.10 (0.01)	0.09 (0.01)	0.08 (0.01)	0.09 (0.01)	0.08 (0.01)	0.09 (0.01)	0.07 (0.01)	0.08 (0.02)	0.08 (0.01)
NiO	0.04 (0.02)	0.03 (0.02)	0.03 (0.01)	0.05 (0.03)	0.05 (0.02)	0.05 (0.01)	0.06 (0.01)	0.04 (0.02)	0.04 (0.02)
MgO	15.33 (0.11)	15.57 (0.33)	15.89 (0.40)	16.35 (0.27)	16.70 (0.16)	16.46 (0.34)	16.53 (0.20)	16.67 (0.32)	16.55 (0.32)
CaO	21.98 (0.18)	22.21 (0.41)	22.62 (0.27)	22.63 (0.14)	22.85 (0.18)	22.70 (0.25)	22.60 (0.07)	22.95 (0.16)	22.67 (0.16)
Na ₂ O	0.76 (0.01)	0.79 (0.02)	0.74 (0.04)	0.66 (0.04)	0.64 (0.02)	0.71 (0.06)	0.63 (0.03)	0.67 (0.04)	0.62 (0.03)
K ₂ O	0.001 (0.002)	0.002 (0.002)	0.001 (0.002)	0.002 (0.003)	0.001 (0.001)	0.002 (0.002)	0.0002 (0.002)	0.001 (0.001)	0.001 (0.002)
Total	99.13 (0.13)	100.04 (0.35)	100.10 (0.44)	100.47 (0.42)	100.51 (0.22)	100.64 (0.32)	99.81 (0.28)	101.07 (0.15)	99.63 (0.13)

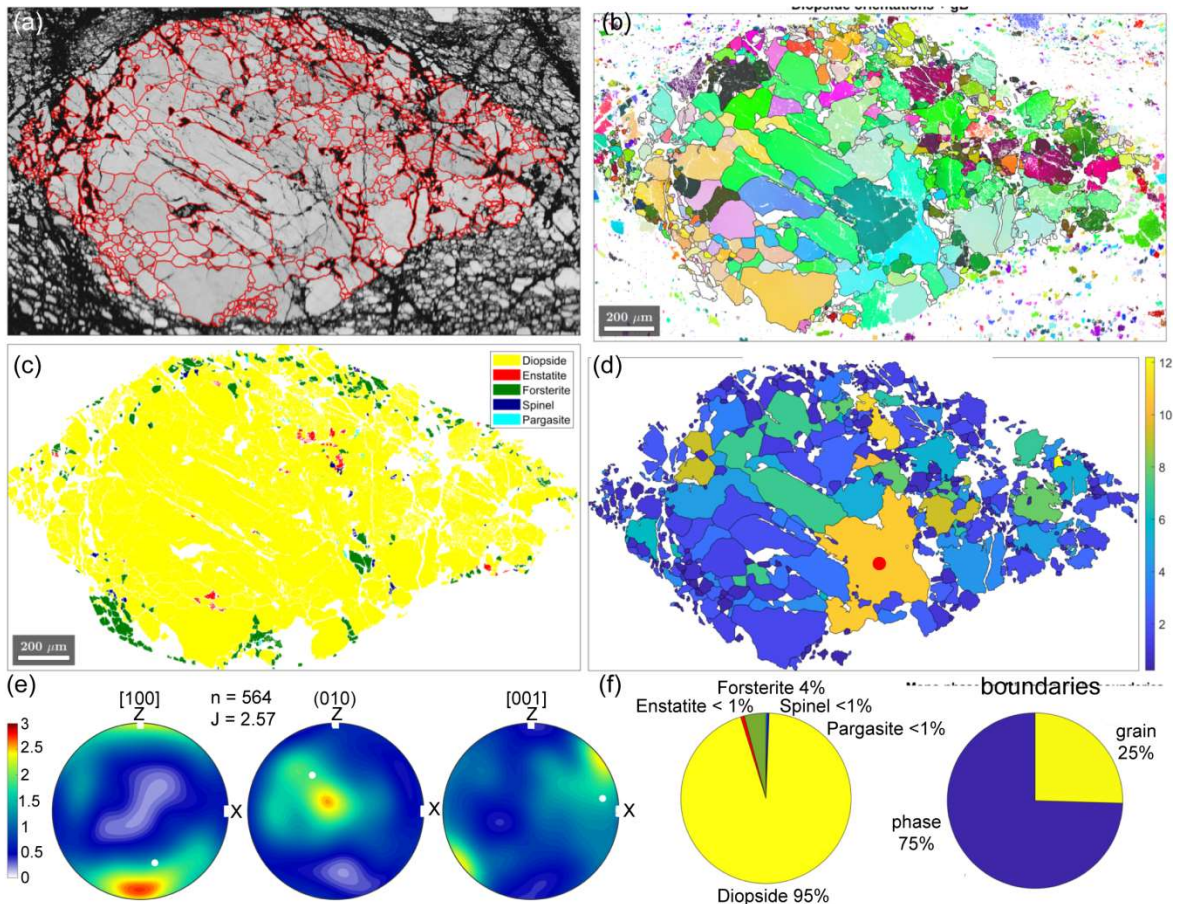


Figure S1. EBSD data of a dynamic recrystallized cpx porphyroblast (ROI16). (a) Band contrast image of the complete map and grain boundaries (red lines) of the area used in the grain, orientation and boundary analysis. Scale the same as in (b) and (c) (b) Orientation data of diopside. (c) Phase map of the area selected for the analysis. (d) Grain orientation spread in the diopside grains. Scale the same as in (b) and (c) (e) CPO of diopside grains, the white dot indicates the orientation of the grain indicated with the red dot in (d). (f) Phase percentages and boundary percentages.

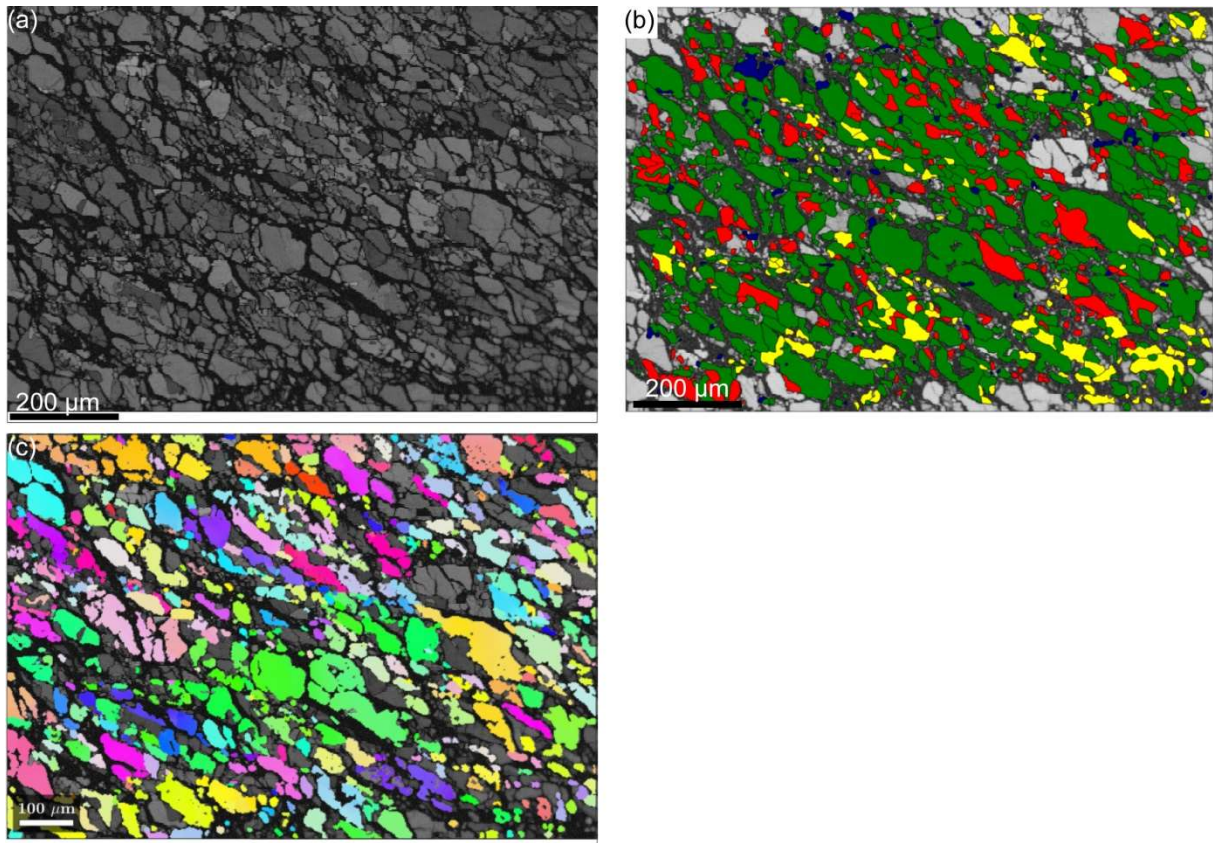


Figure S2. EBSD maps of the olivine-rich matrix. (a) Band contrast image. (b) Phase map with forsterite (green), enstatite (red), diopside (yellow) and spinel (blue), same scale as (c). (c) Olivine orientations.

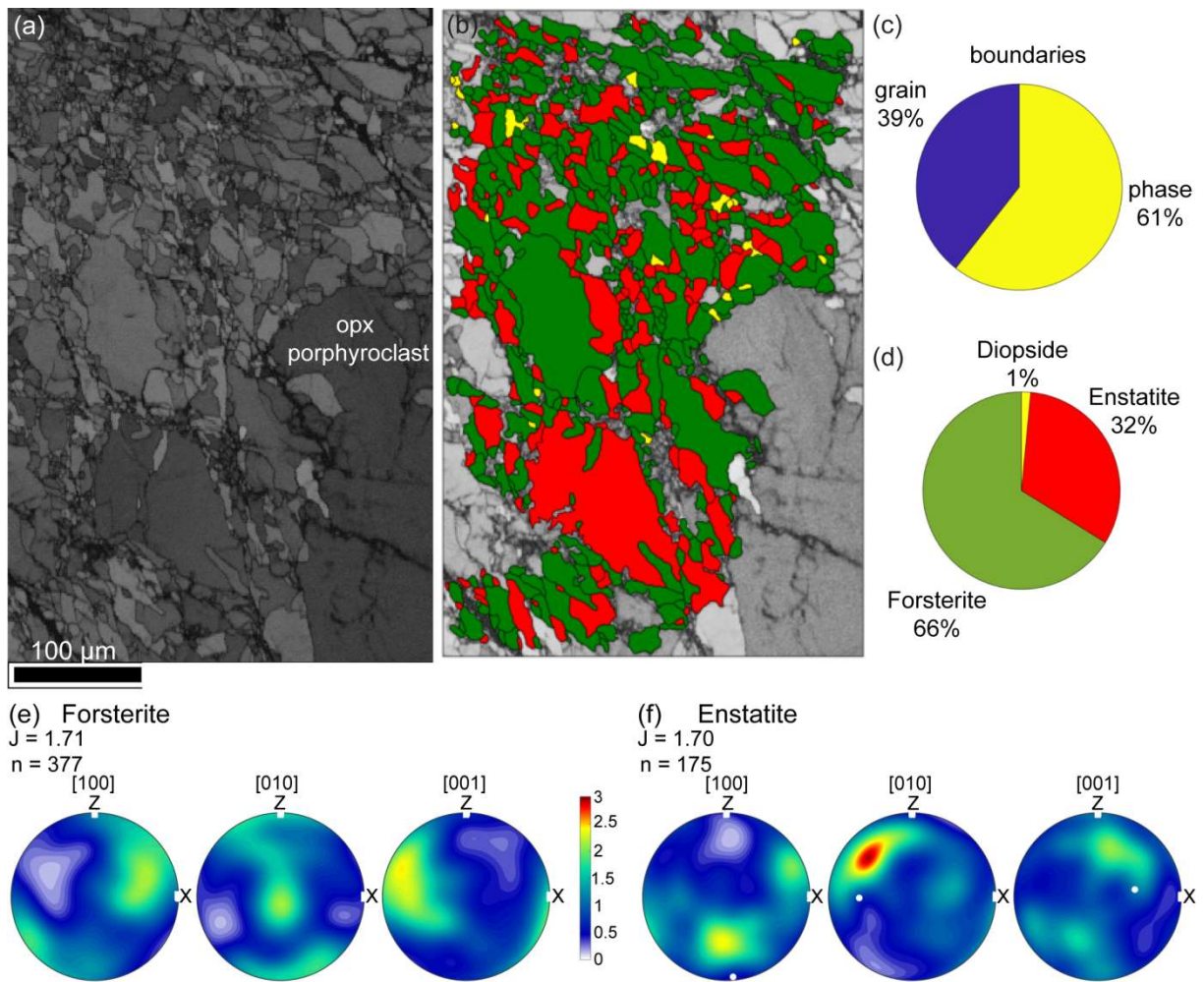


Figure S3. EBSD data of a recrystallized opx porphyroclast (ROI 24). (a) Band contrast (b) Phase map, colours as in the area percentage pie chart in (d). (c) Phase and grain boundaries percentages (d) Area percentages of the different phases. (e) Forsterite CPO. (f) Enstatite CPO. Indicated is the orientation of the porphyroclast (white dot).

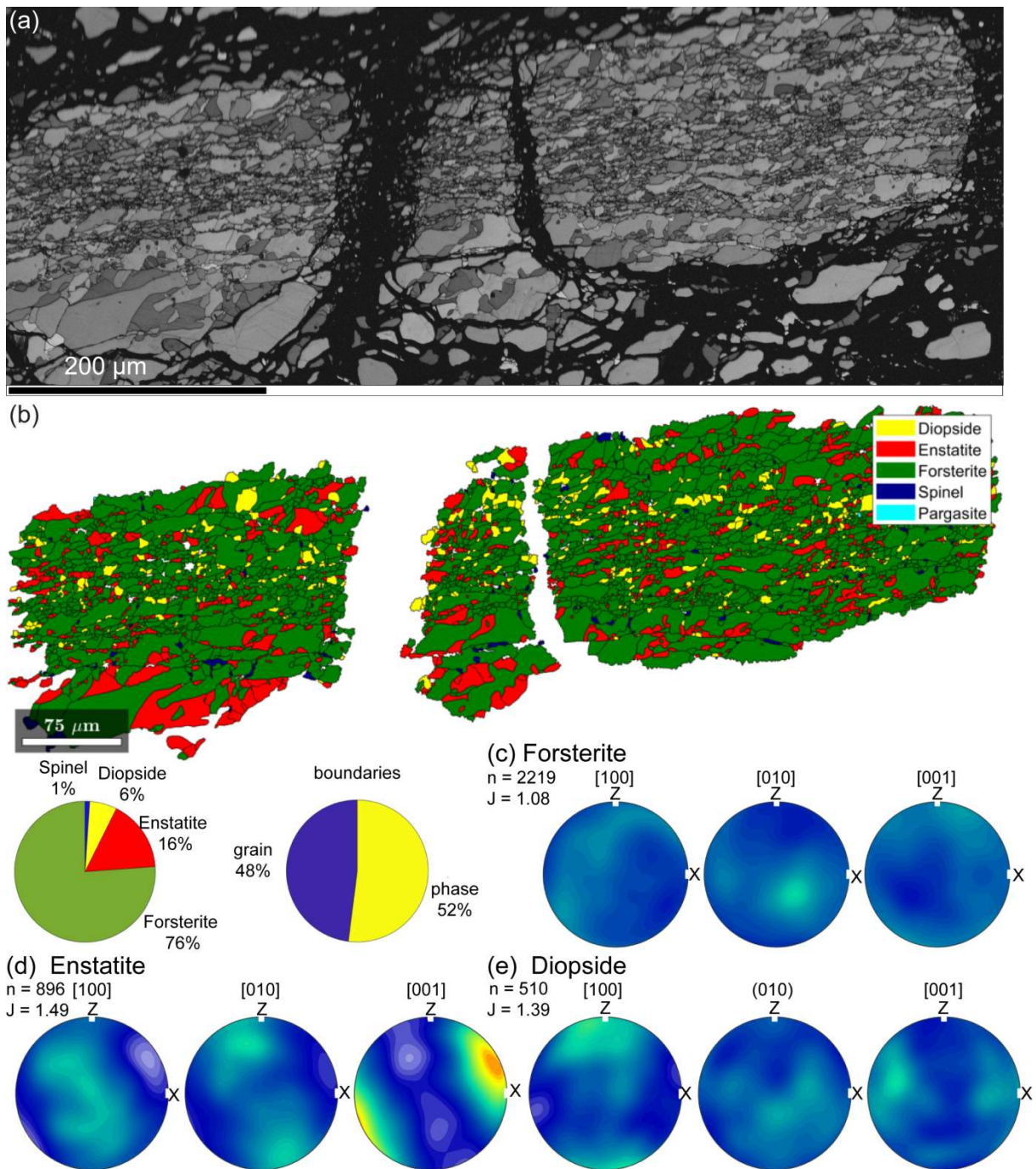


Figure S4. EBSD data of a fine-grained layer (ROI14). (a) Band contrast image. (b) Phase map with the area % of the phases and the percentages of phase and grain boundaries. (c) Forsterite CPO. (d) Enstatite CPO. (e) Diopside CPO.

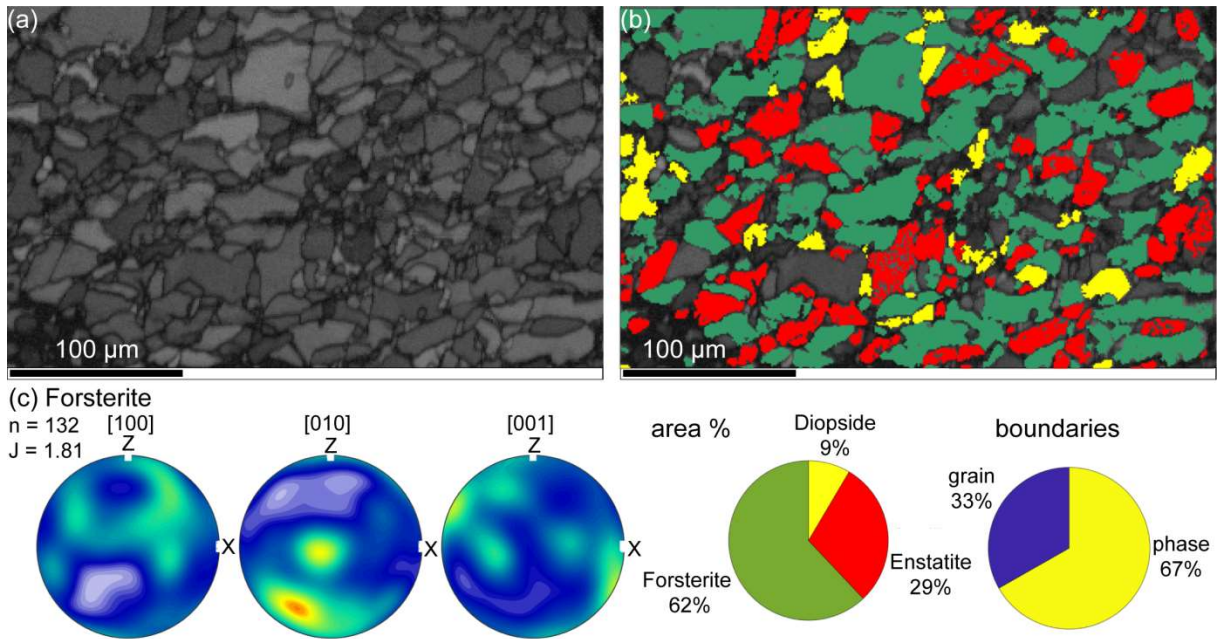


Figure S5. EBSD map of a fine-grained layer (ROI23). (a) Band contrast map. (b) Phase map, with underneath the pie charts of the area % and boundaries. (c) Forsterite CPO.

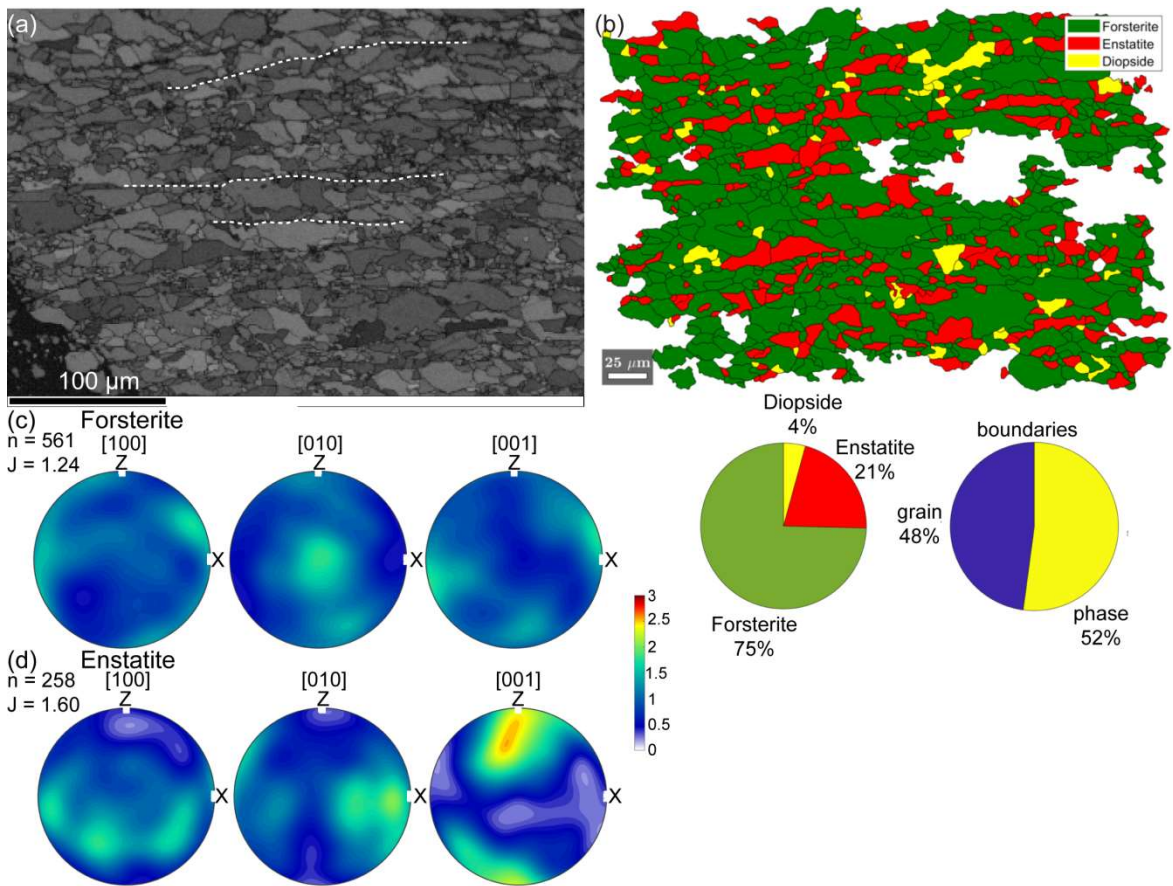


Figure S6. EBSD data of a fine-grained layer (ROI 23). (a) Band contrast of the area, dashed white lines follow some of the horizontal cracks in the layer. (b) Phase map of the area. Below are indicated the area percentages and phase and grain boundary percentages. (c) Forsterite CPO. (d) Enstatite CPO.