

Appendix #1

for the study

“The quench control of water estimates in convergent margin magmas”

from

M. Gavrilenko, M. Krawczynski, P. Ruprecht, W. Li, and J. Catalano

images of all experimental products

obtained by

optical microscope and

electron microprobe (SE, BSE)

textures of 22 samples

(from the lowest pre-loaded H₂O content to the highest)

Microscope

F085

1.3 wt%
of H₂O loaded

1300°C, 1.0 GPa

(Glass +
small amount Px)

2mm

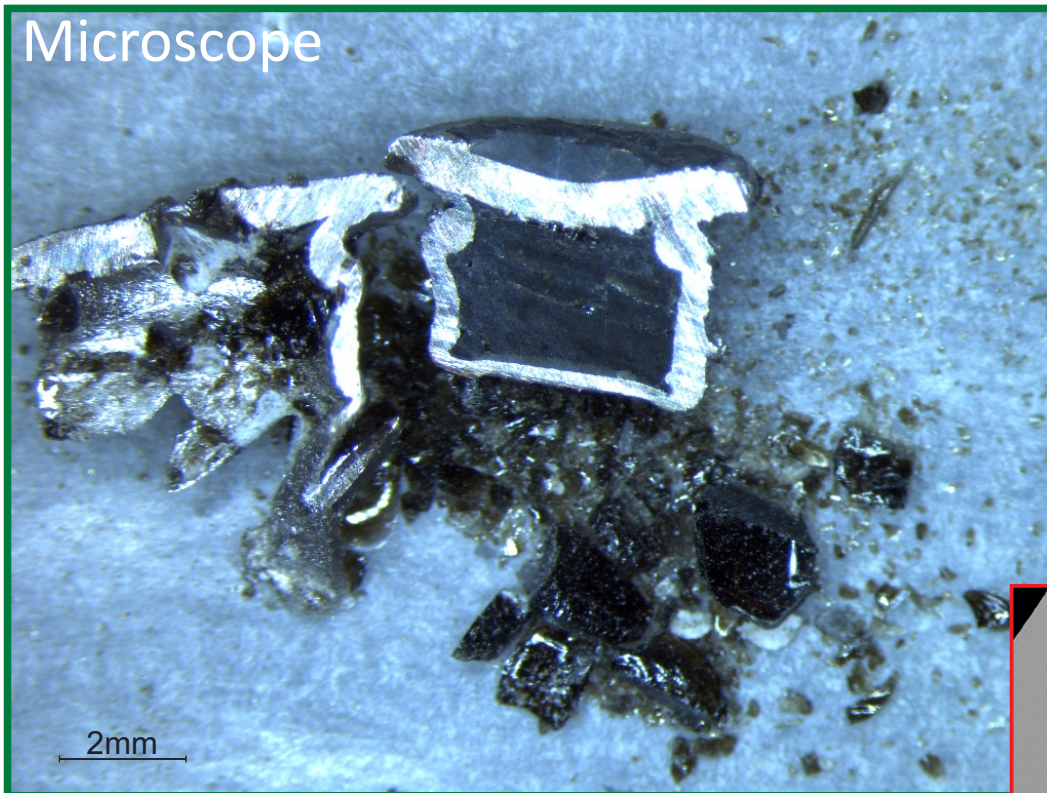
BSE

WUSTL COMP 15.0kV

x450

10µm WD11mm

Microscope



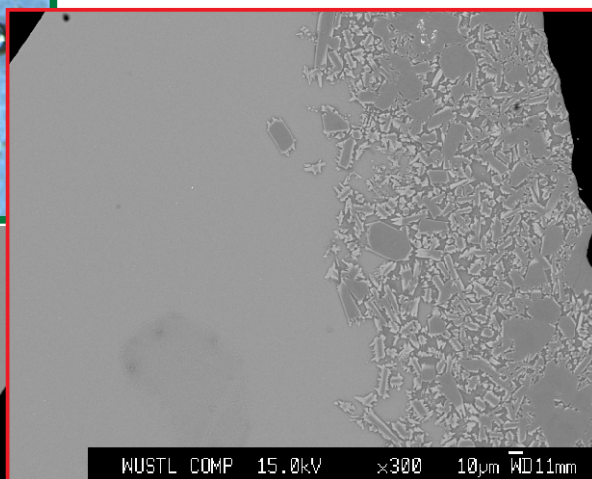
F087

3.3 wt%
of H₂O loaded

1300°C, 1.0 p GPa

(Glass +
small amount Px)

BSE



WUSTL COMP 15.0kV

x40

100µm WD11mm

Microscope

F099

4.1 wt%
of H₂O loaded

1300°C, 1.5 GPa

(Glass +
small amount Px)

2mm

BSE

SE

WUSTL COMP 15.0kV ×150 100μm WD11mm

WUSTL SEI 15.0kV ×40 100μm WD11mm

Microscope

F088

5.0 wt%
of H₂O loaded

1300°C, 1.0p GPa

2mm

(Glass only)

BSE

WUSTL COMP 15.0kV

x40 100µm WD11mm

Microscope

F079

5.9 wt%
of H₂O loaded

1225°C, 1.0 GPa

(Glass + rare
quench crystals)

2mm

BSE

WUSTL COMP 15.0kV x370 10µm WD11mm

WUSTL COMP 15.0kV x150 100µm WD11mm

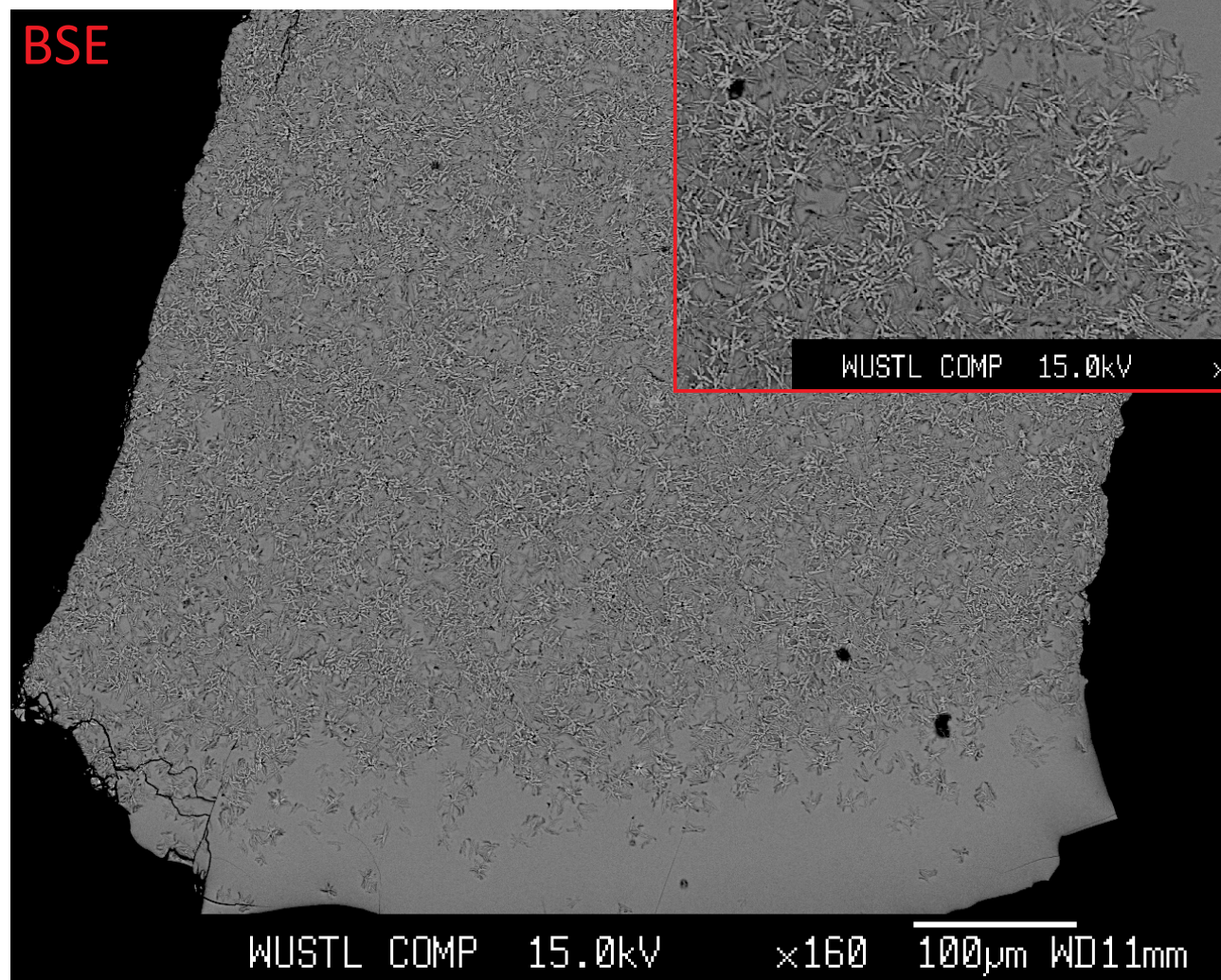
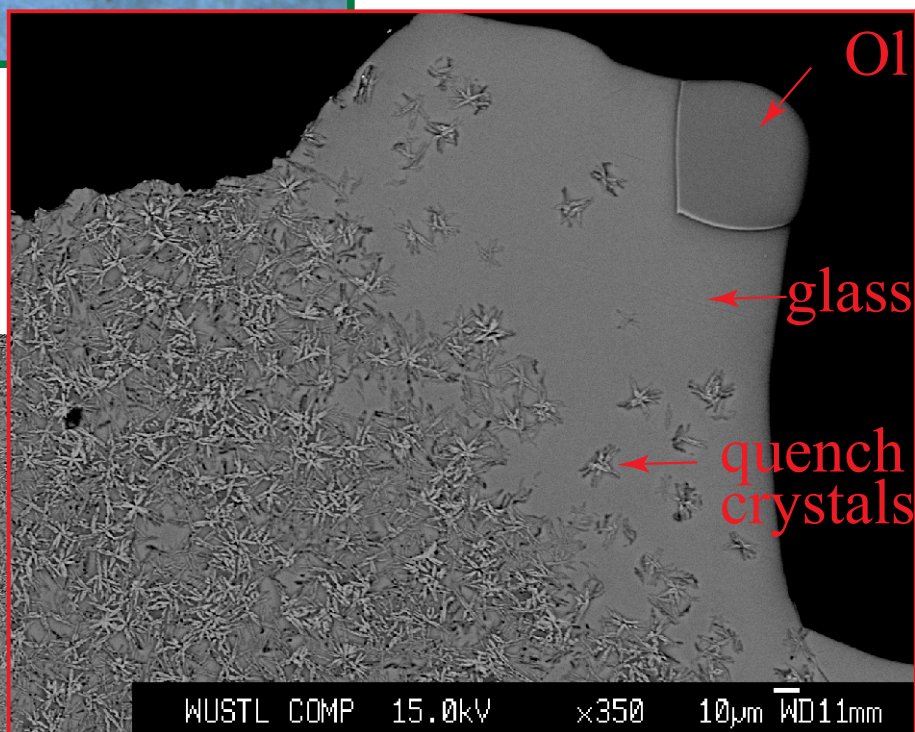
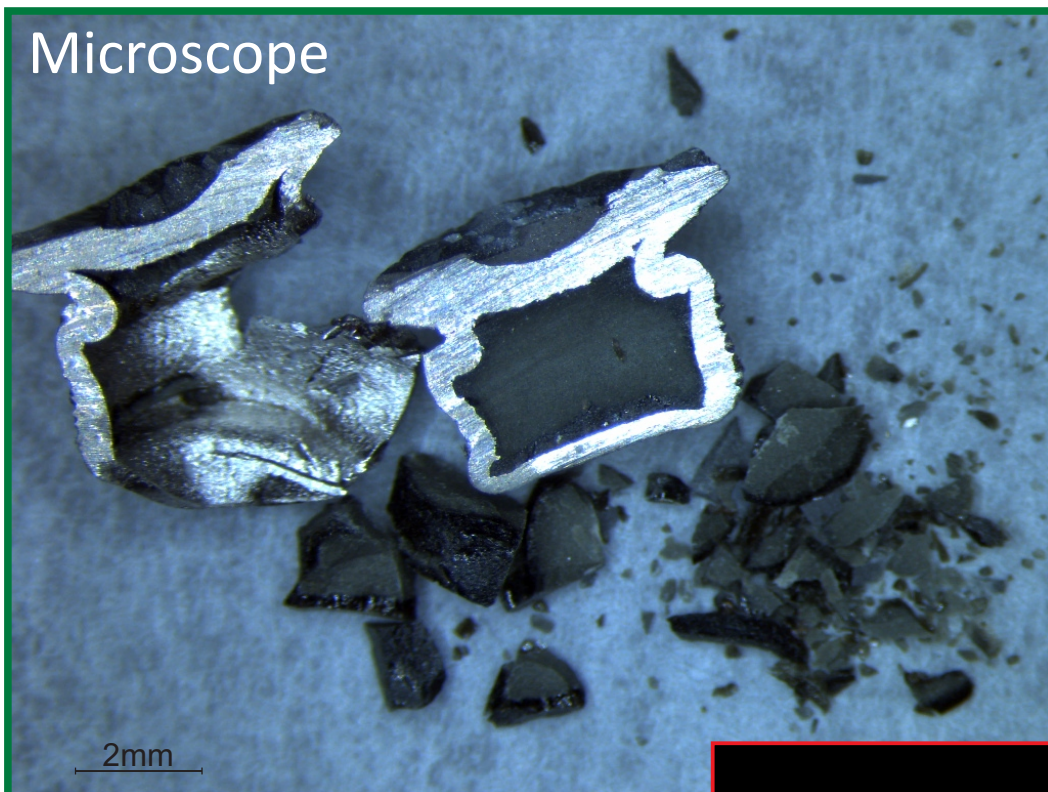
Microscope

F076

6.8 wt%
of H₂O loaded

1225°C, 1.0 GPa

(Glass + OL +
quench crystals)



Microscope

F089

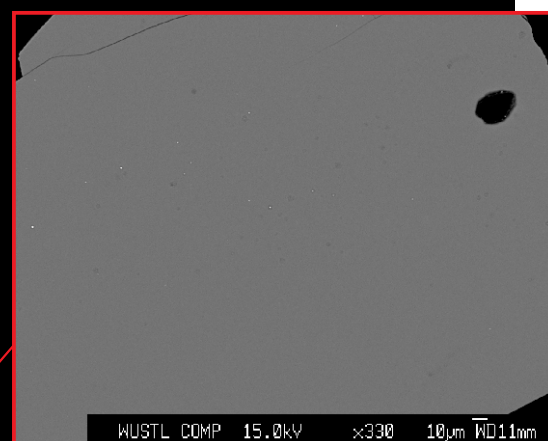
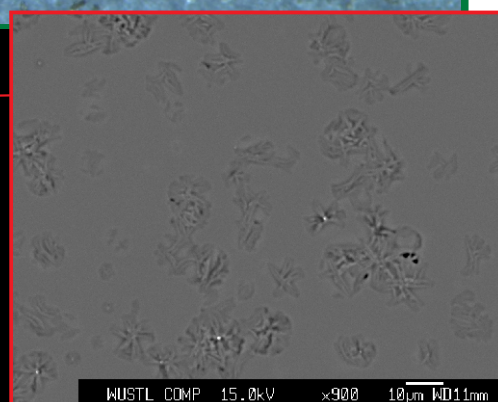
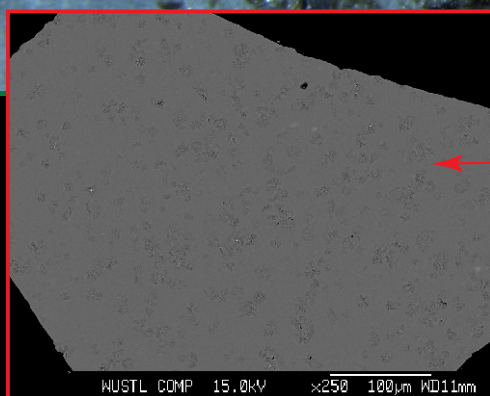
6.8 wt%
of H₂O loaded

1300°C, 1.0p GPa

(Glass +
quench crystals)

2mm

BSE



WUSTL COMP 15.0kV x40 100µm WD11mm

Microscope

2mm

F075

7.6 wt%
of H₂O loaded

1225°C, 1.0 GPa

(Glass +
quench crystals)

SE

zoom in

WUSTL SEI 15.0kV x40 100µm WD11mm

WUSTL SEI 15.0kV x160 100µm WD11mm

BSE

zoom in

WUSTL COMP 15.0kV x40 100µm WD11mm

WUSTL COMP 15.0kV x160 100µm WD11mm

Microscope

2mm

F106

8.0 wt%
of H₂O loaded

1300°C, 1.0 p GPa

(Glass +
quench crystals)

zoom in

BSE

WUSTL COMP 15.0kV x300 10 μ m WD11mm

WUSTL COMP 15.0kV x140 100 μ m WD11mm

Microscope

F073

8.2 wt%
of H₂O loaded

1225°C, 1.0 GPa

(Glass +
quench crystals)

2mm

BSE

WUSTL COMP 15.0kV x110 100µm WD11mm

WUSTL COMP 15.0kV x65 100µm WD11mm

WUSTL COMP 15.0kV x40 100µm WD11mm

zoom in

WUSTL COMP 15.0kV x600 10µm WD11mm

Microscope

F068

8.7 wt%
of H₂O loaded

1225°C, 1.0 GPa

zoom in

2mm

(Vesicular glass
+ olivines)

BSE

WUSTL COMP 15.0kV x250 100µm WD11mm

Ol

WUSTL COMP 15.0kV x110 100µm WD11mm

SE

WUSTL SEI 15.0kV x250 100µm WD11mm

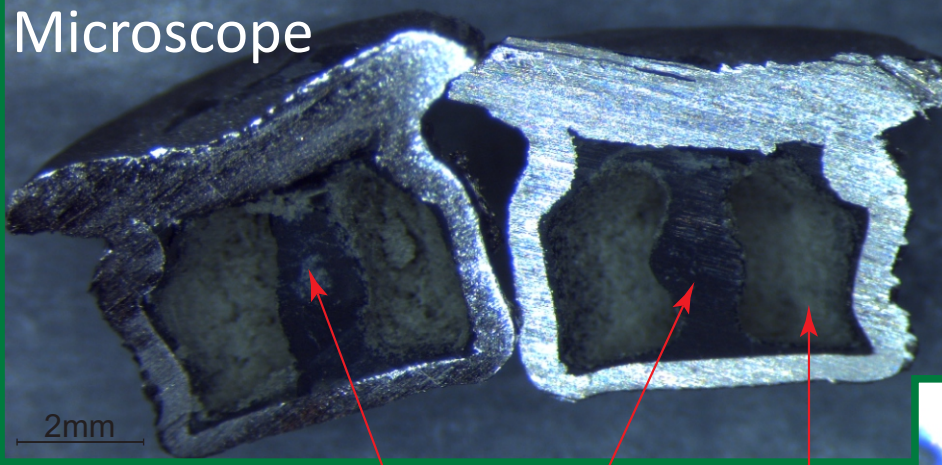
WUSTL SEI 15.0kV x110 100µm WD11mm

Microscope

F090

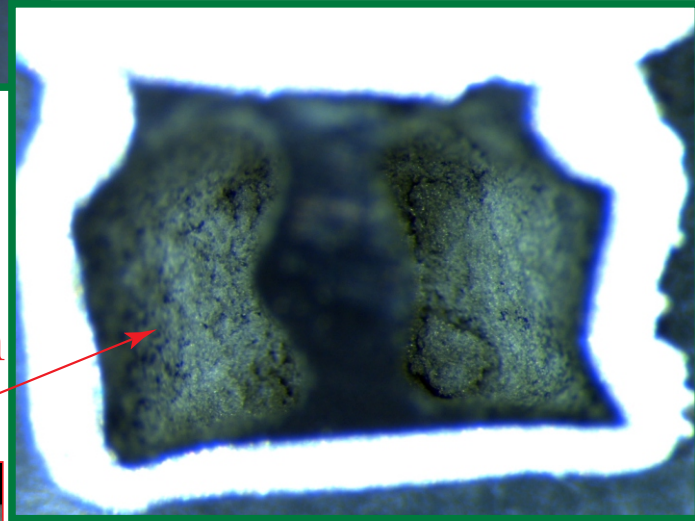
8.7 wt%
of H₂O loaded

1300°C, 1.0 p GPa

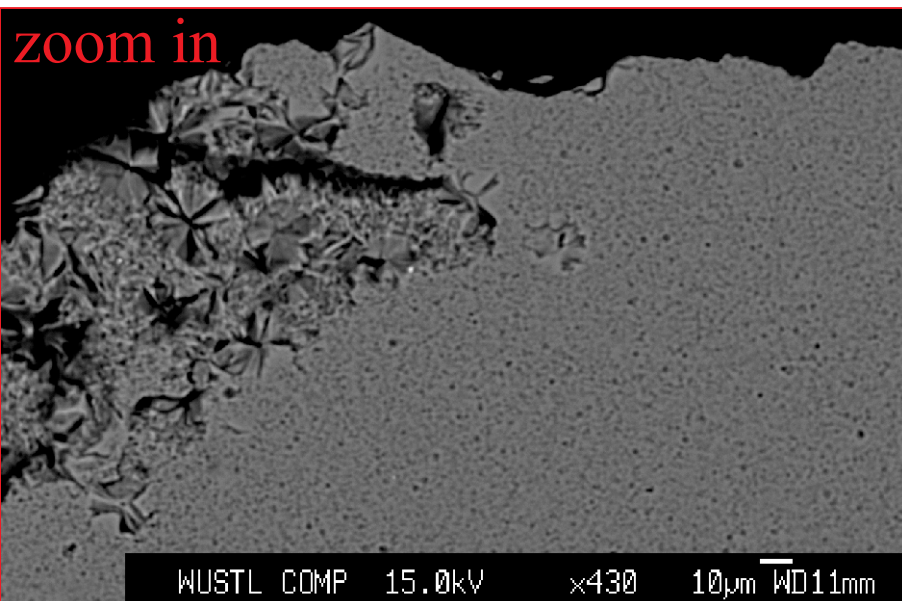


vesicular glass
in the middle

non-glassy quench
materials



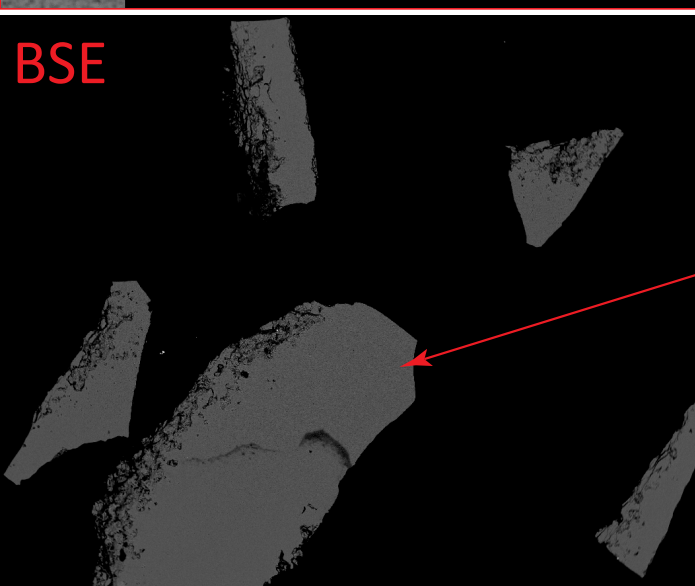
zoom in



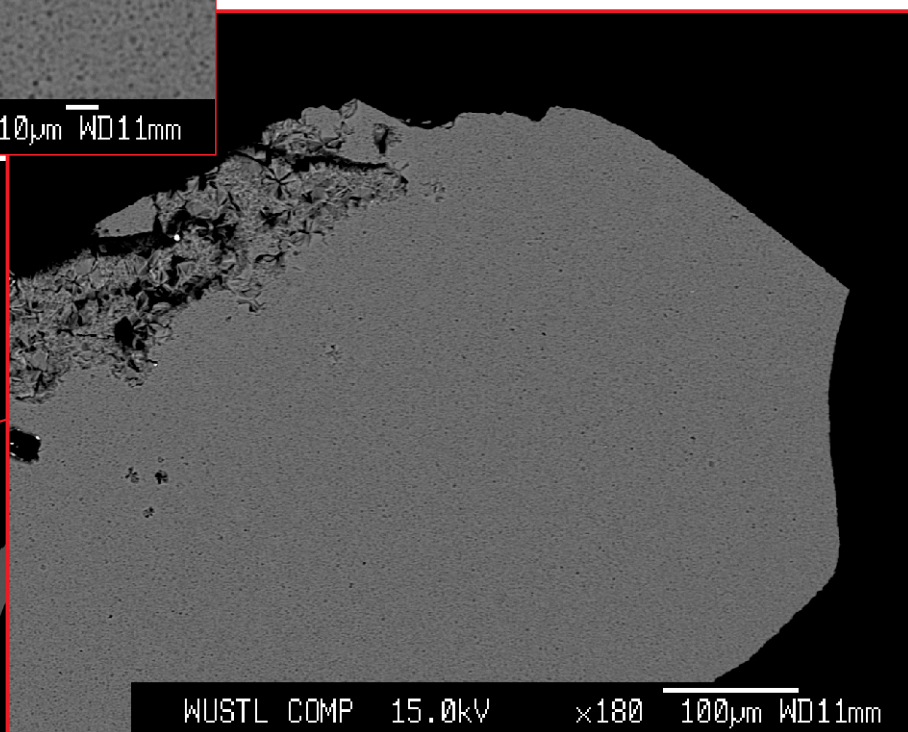
WUSTL COMP 15.0kV x430 10 μ m WD11mm

(Vesicular glass
+ alteration products)

BSE



WUSTL COMP 15.0kV x40 100 μ m WD11mm



WUSTL COMP 15.0kV x180 100 μ m WD11mm

Microscope

F080

9.0 wt%
of H₂O loaded

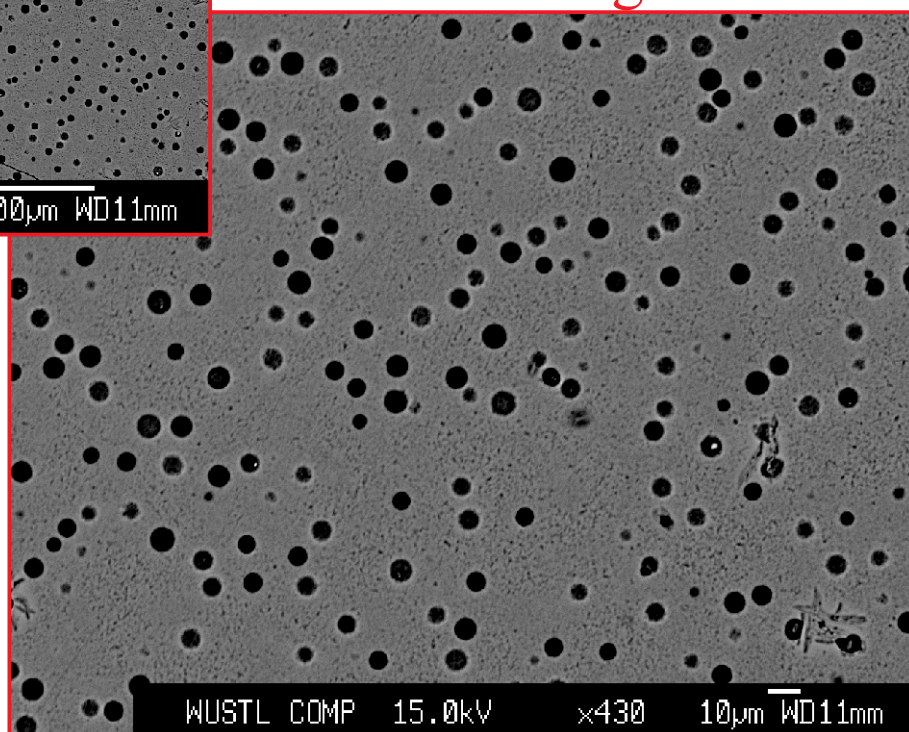
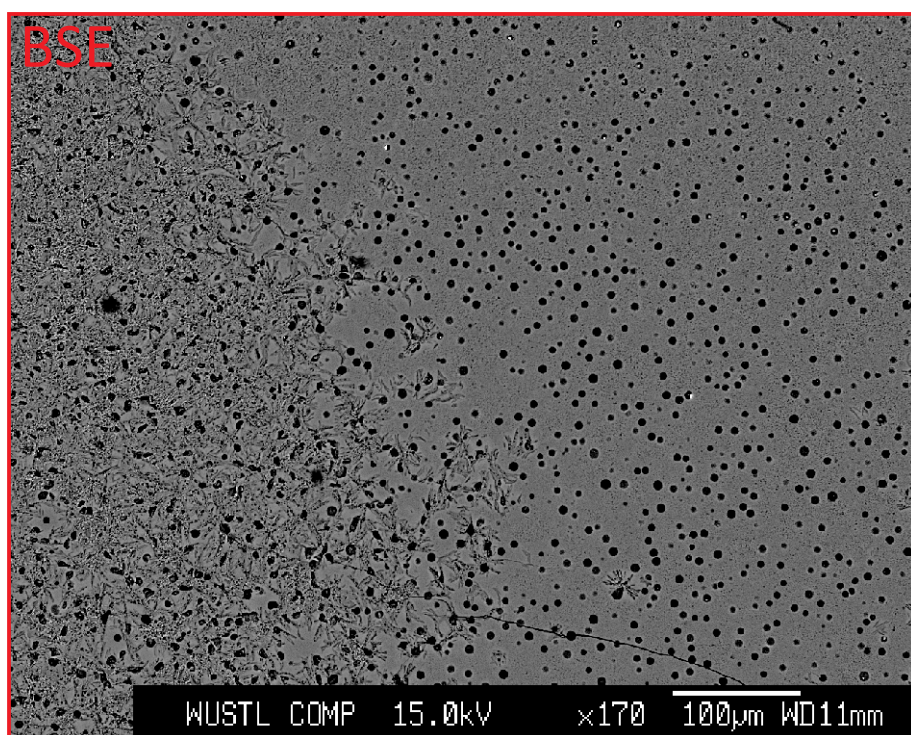
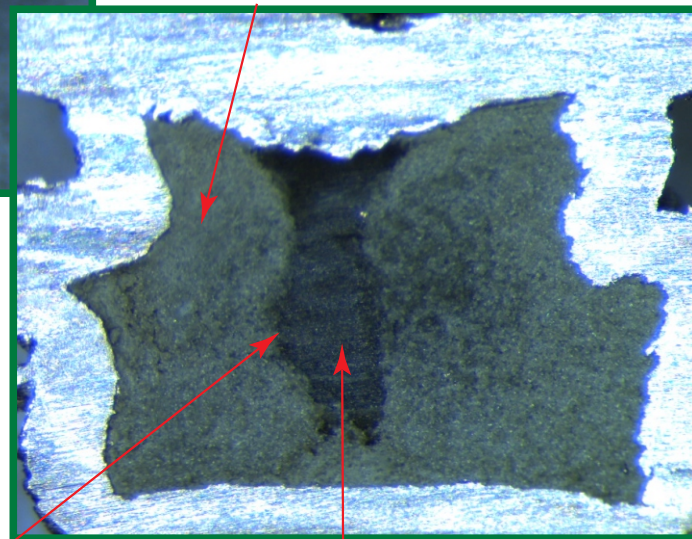
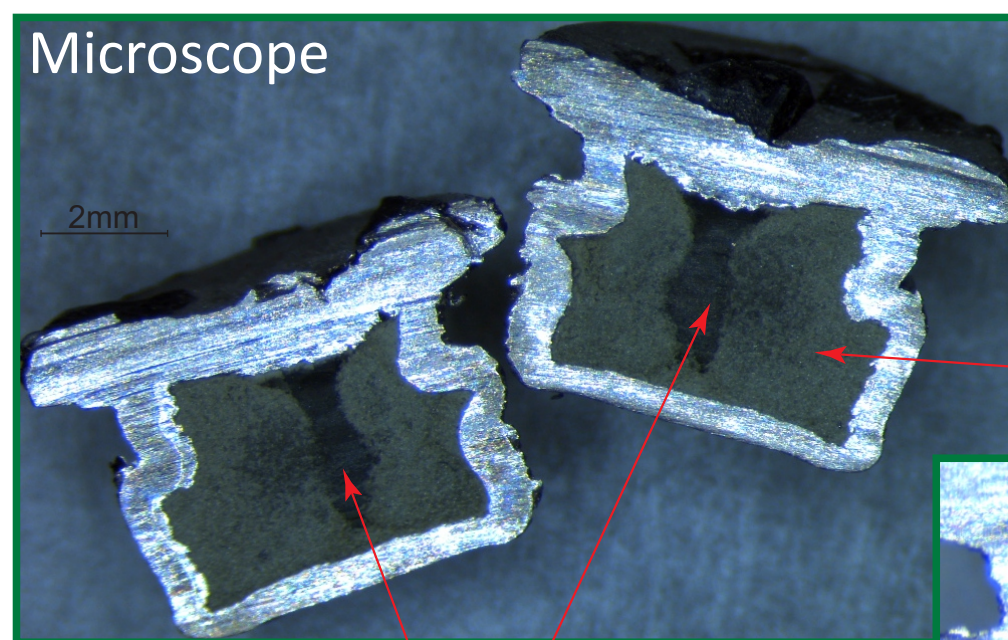
1225°C, 1.0 GPa

non-glassy quench
materials

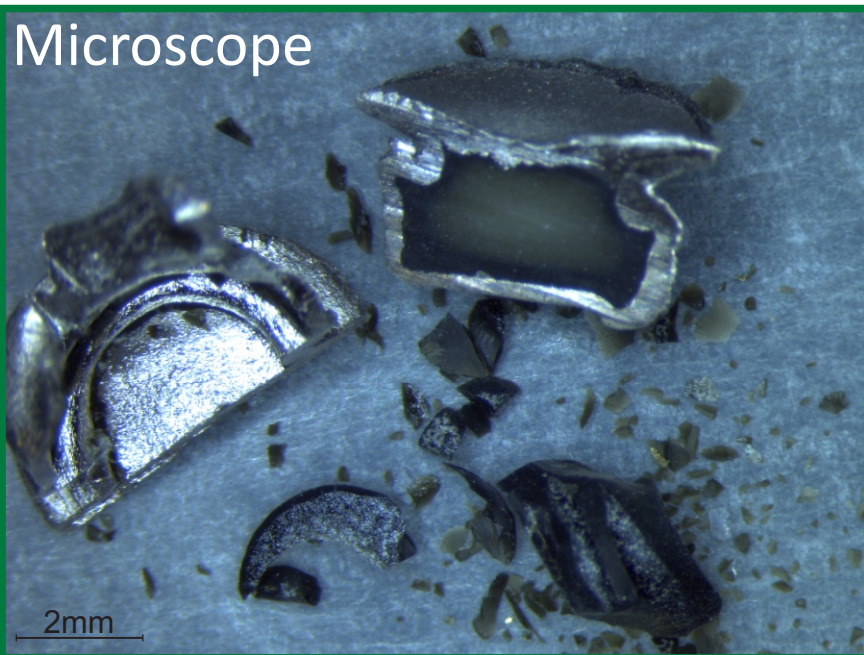
vesicular glass
in the middle

central part
is presented by
vesicular glass

peripheral part of
the vesicular glass



Microscope

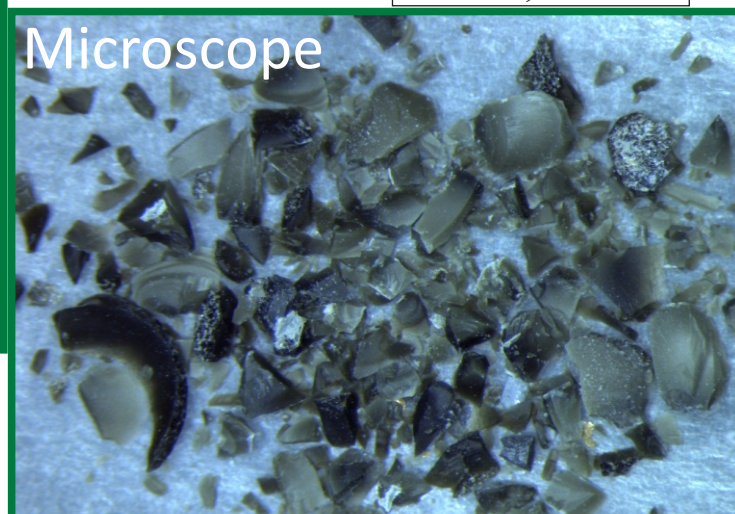


F074

9.9 wt%
of H₂O loaded

1225°C, 1.0 GPa

Microscope



zoom in

BSE

WUSTL COMP 15.0kV x100 100µm WD11mm

SE

WUSTL SEI 15.0kV x100 100µm WD11mm

WUSTL SEI 15.0kV x500 10µm WD11mm

WUSTL COMP 15.0kV x500 10µm WD11mm

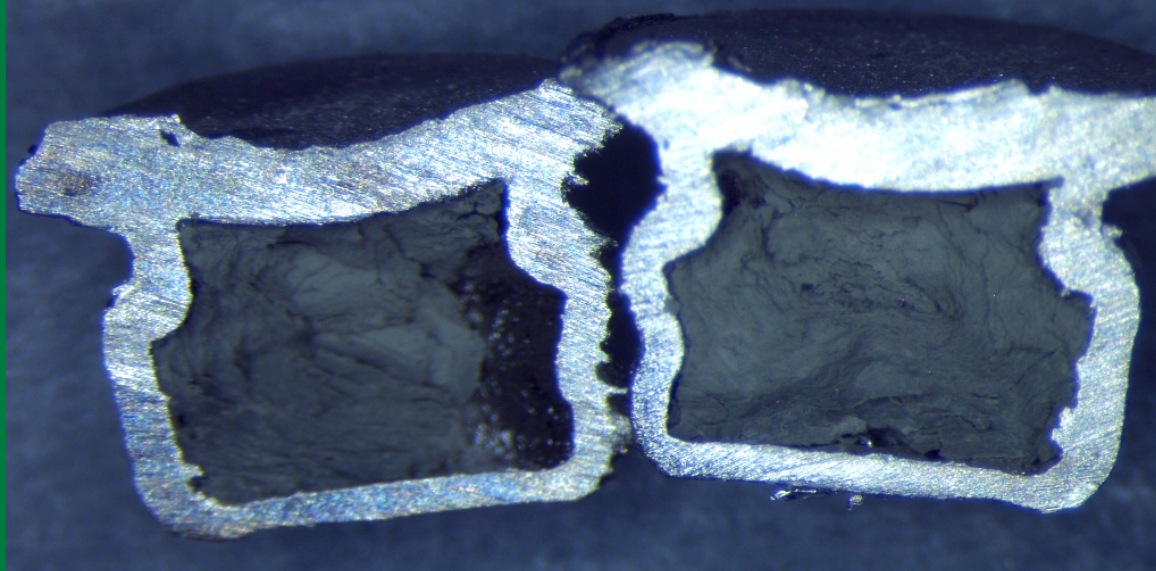
Microscope

2mm

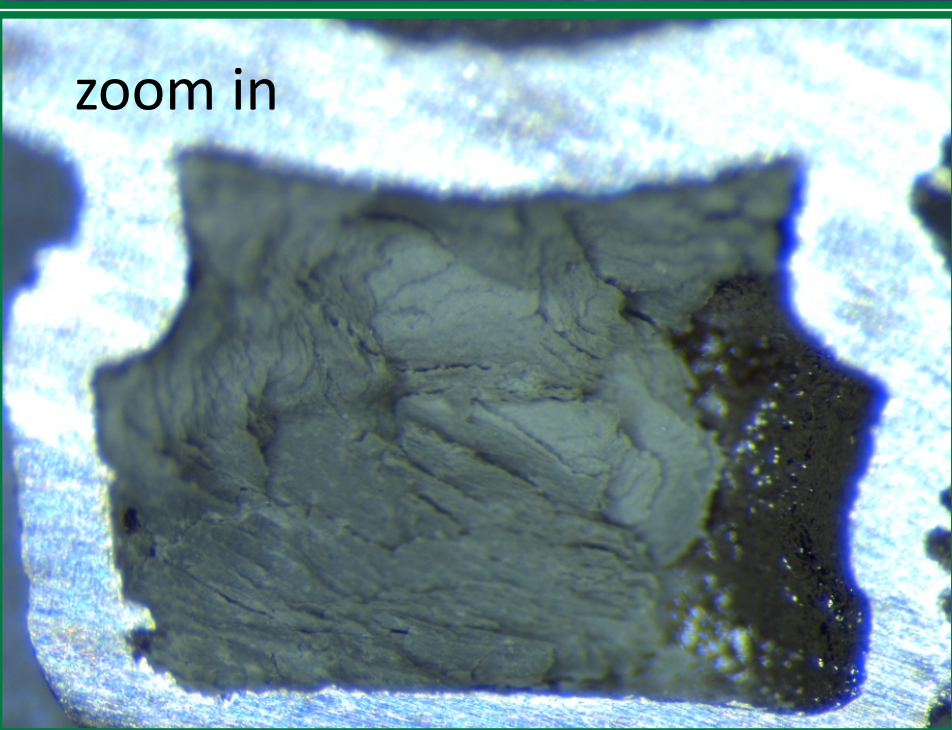
F091

10.0 wt%
of H₂O loaded

1300°C, 1.0p GPa

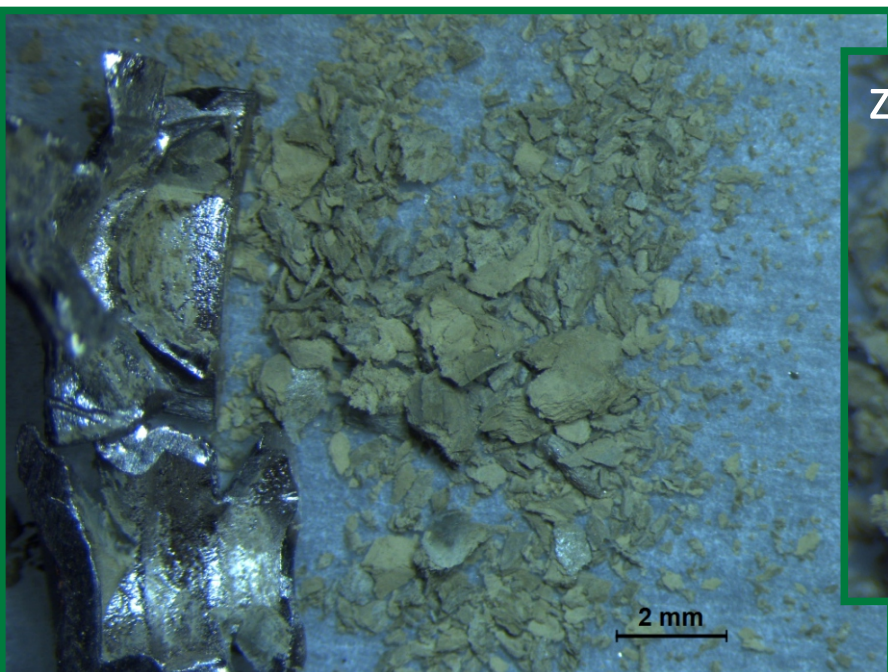


zoom in

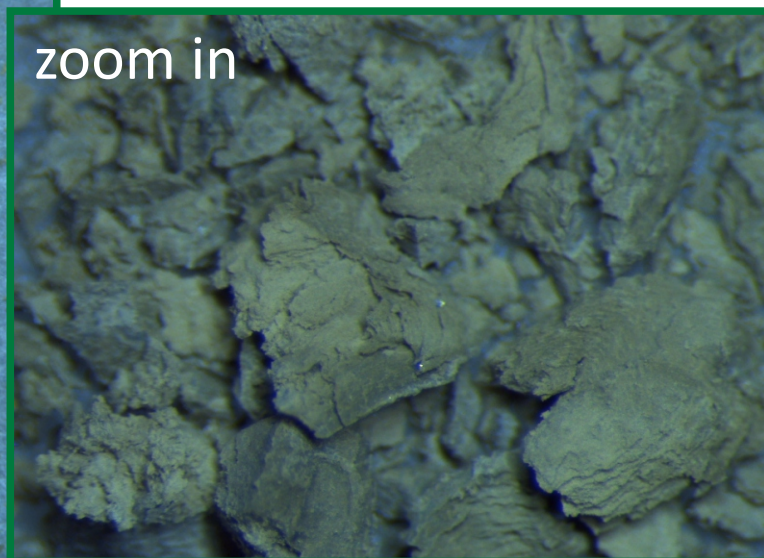


non-glassy quench
materials

(see BSE images
in the Appendix #2)



zoom in



Microscope

F069

12.2 wt%
of H₂O loaded

1225°C, 1.0 GPa

2mm

zoom in

BSE

zoom in

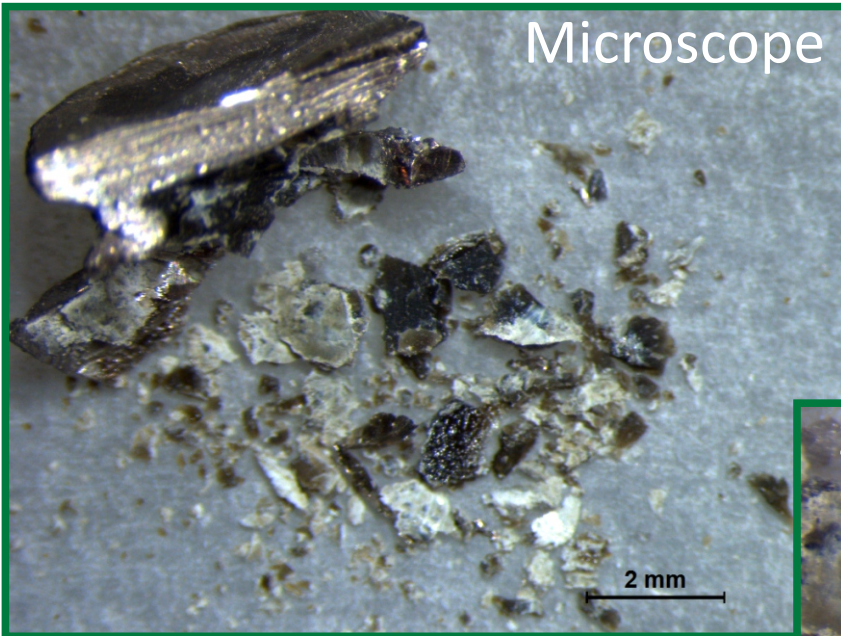
WUSTL COMP 15.0kV x50 100µm WD11mm

WUSTL COMP 15.0kV x170 100µm WD11mm

SE

WUSTL SEI 15.0kV x50 100µm WD11mm

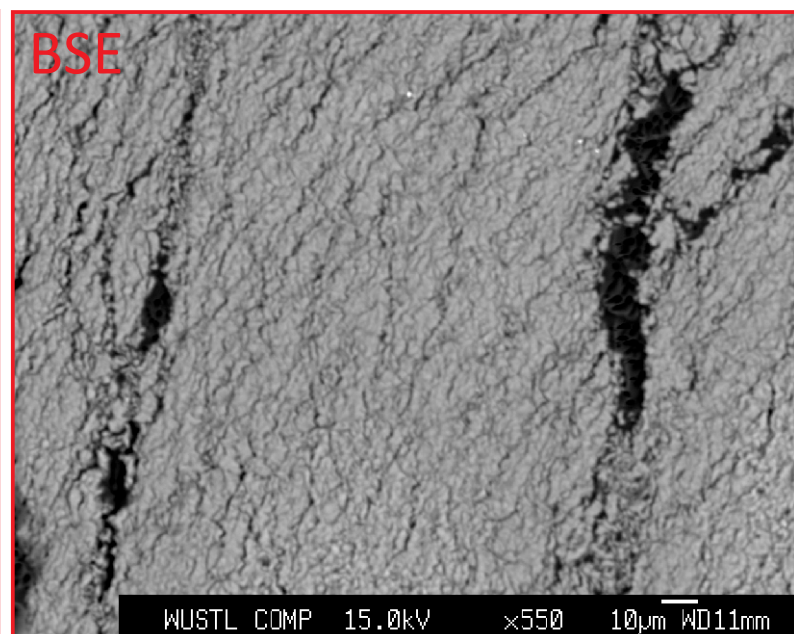
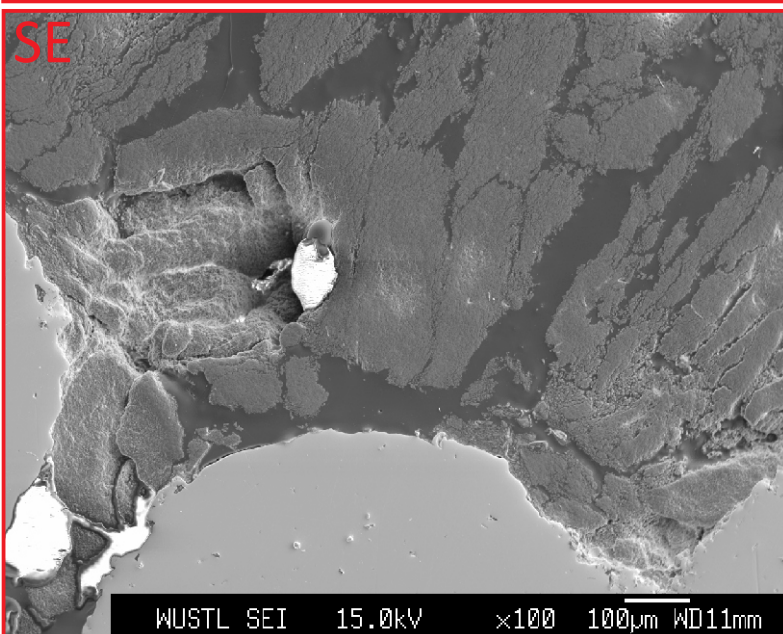
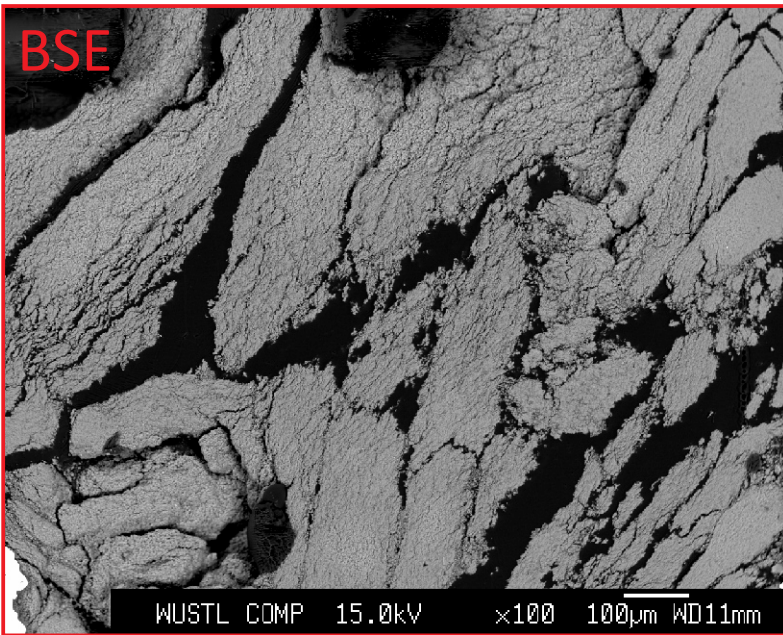
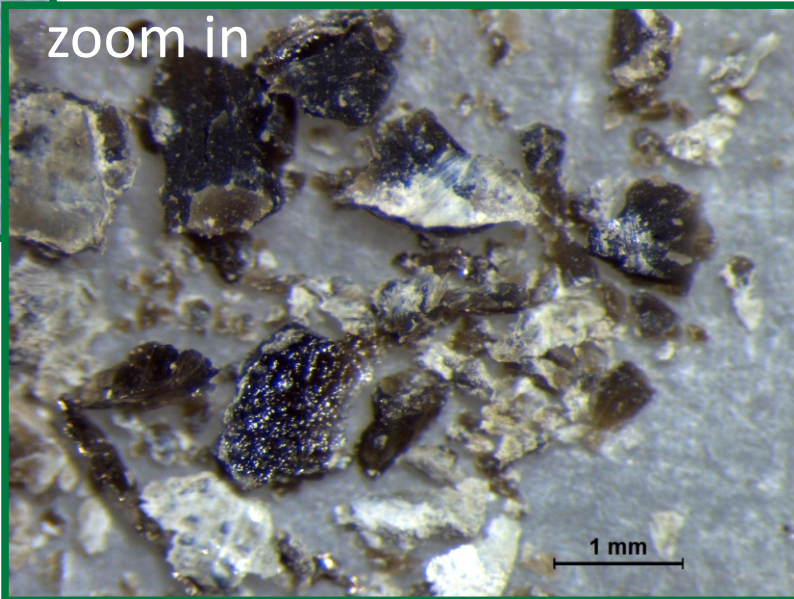
WUSTL SEI 15.0kV x170 100µm WD11mm



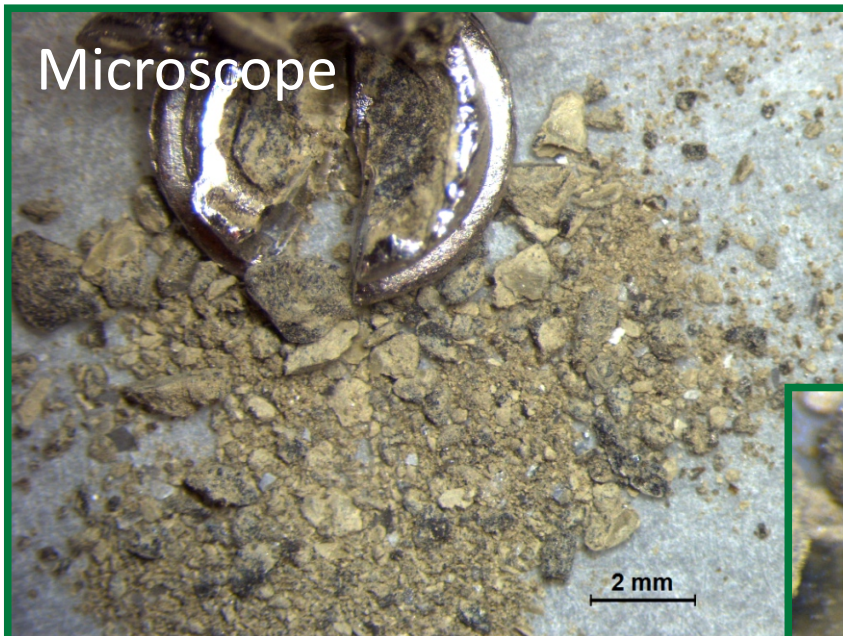
F107

12.2 wt%
of H₂O loaded

1300°C, 1.0p GPa



Microscope

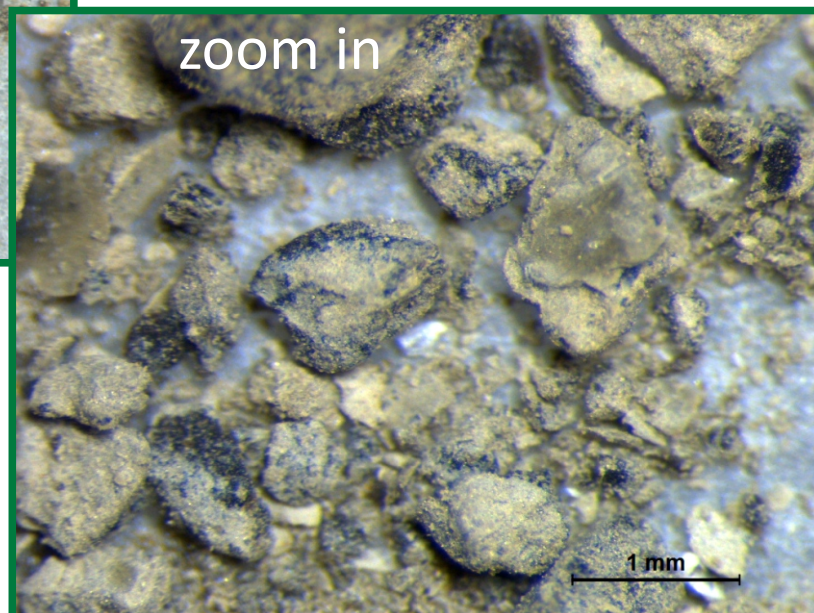


F098

12.6 wt%
of H₂O loaded

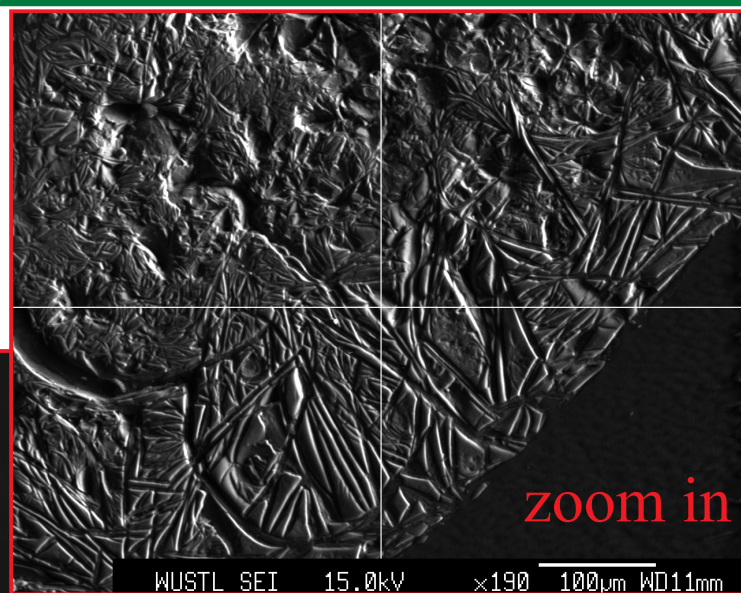
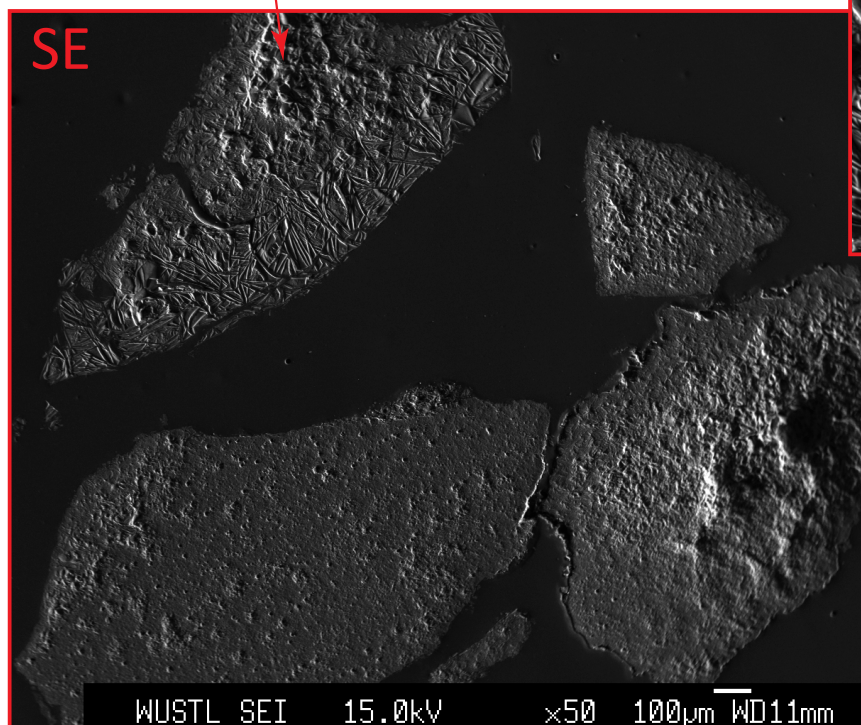
1300°C, 1.5 GPa

zoom in



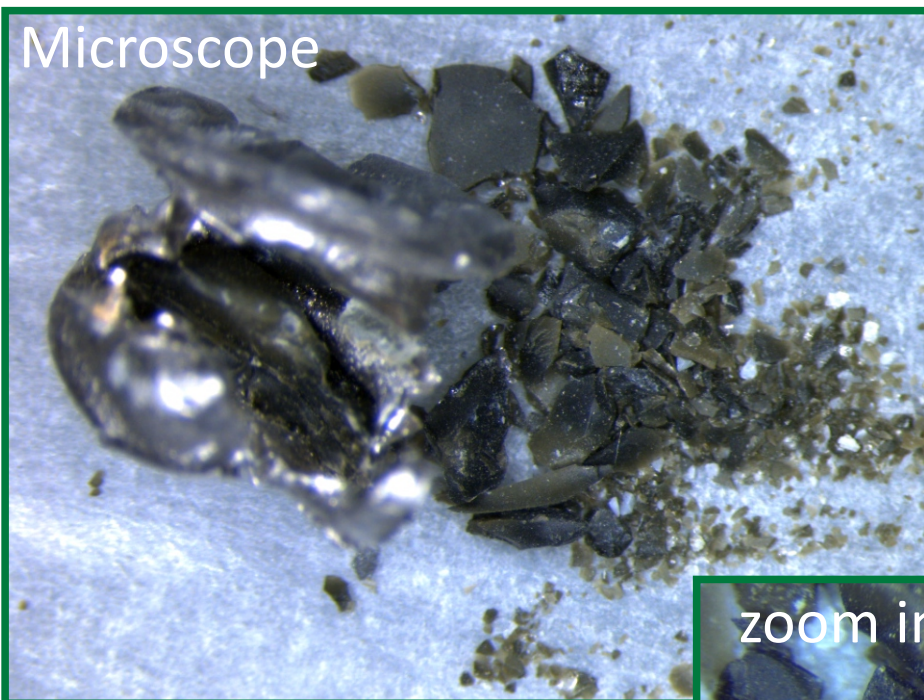
too soft to be polished

SE



(see more BSE images
in the Appendix #2)

Microscope

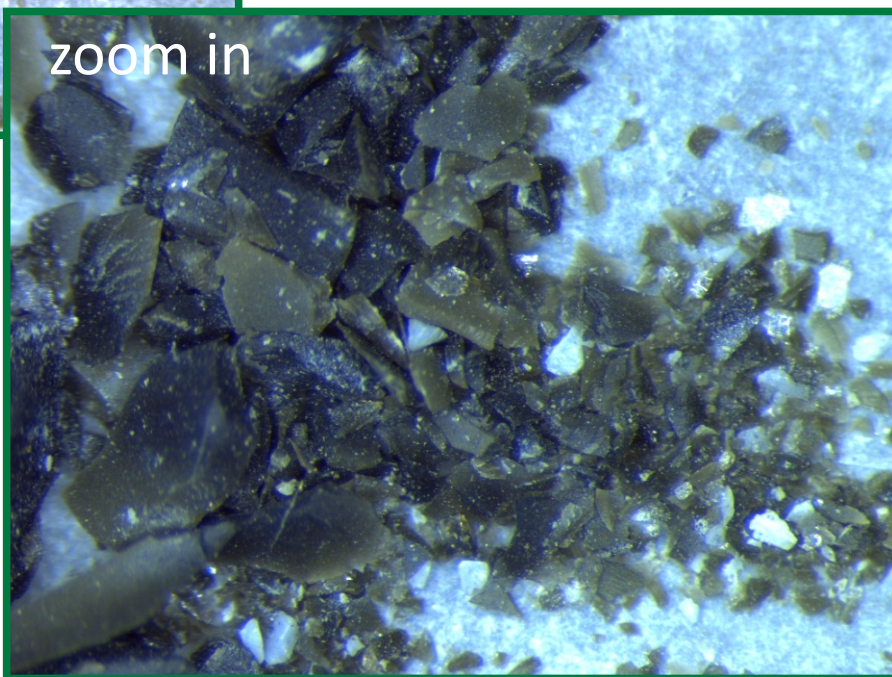


F070

15.1 wt%
of H₂O loaded

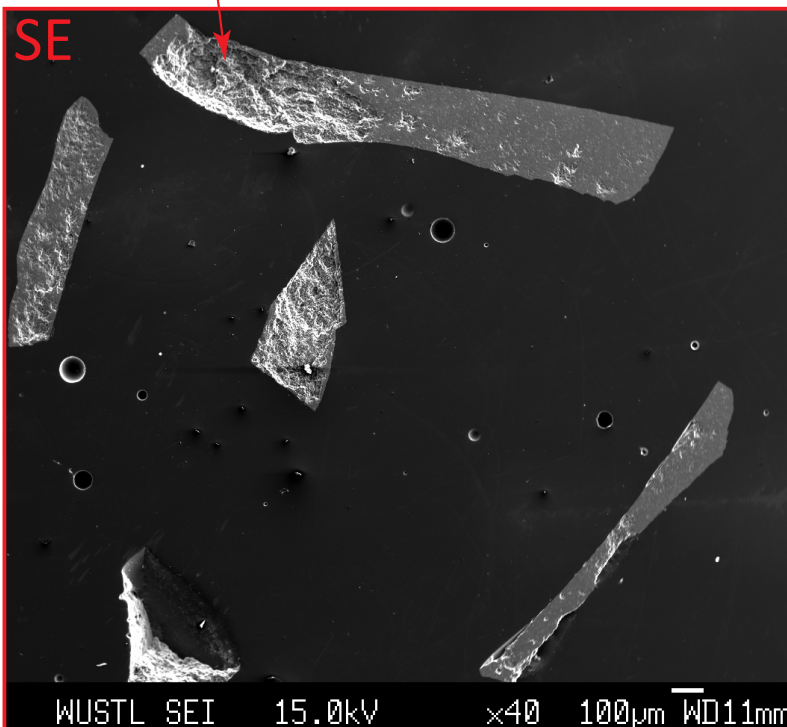
1225°C, 1.0 GPa

zoom in

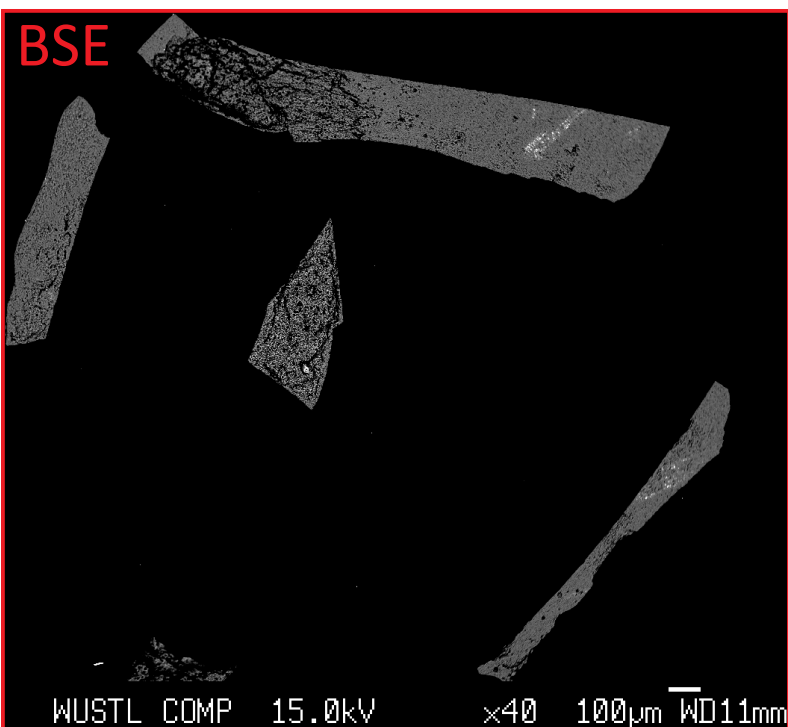


too soft to be polished

SE



BSE



Microscope

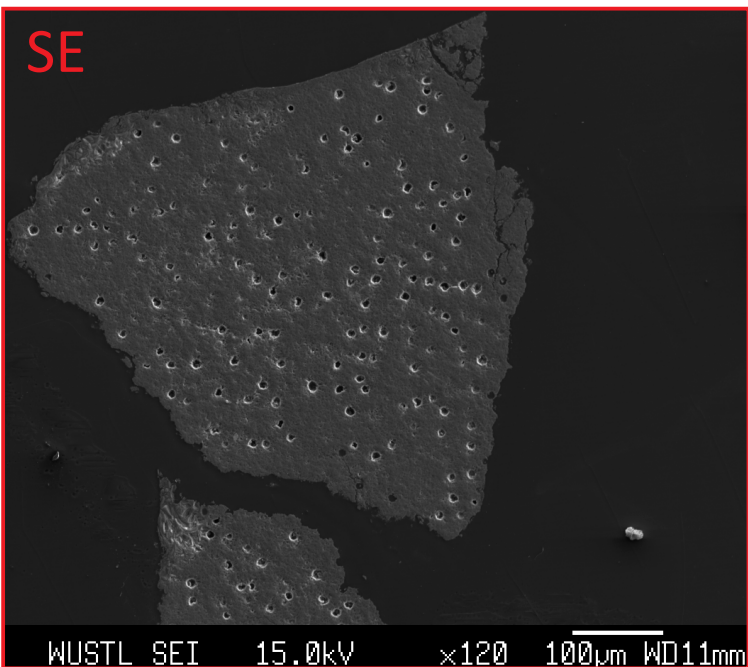
F071

18.0 wt%
of H₂O loaded

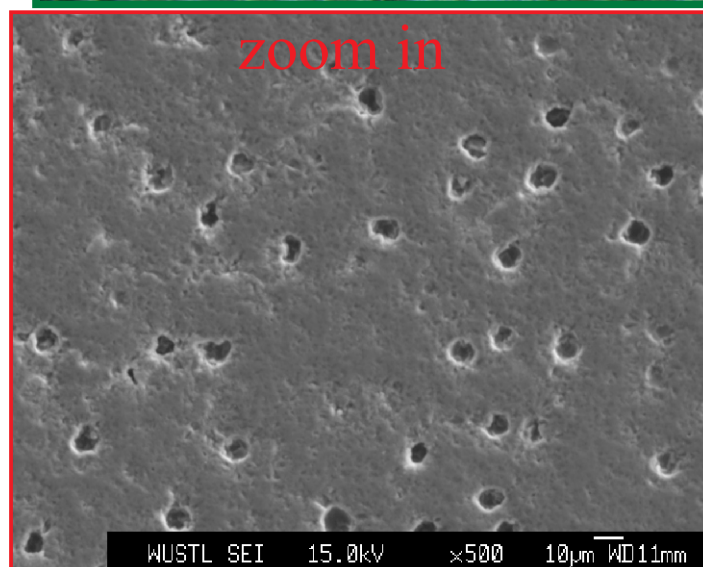
1225°C, 1.0 GPa

zoom in

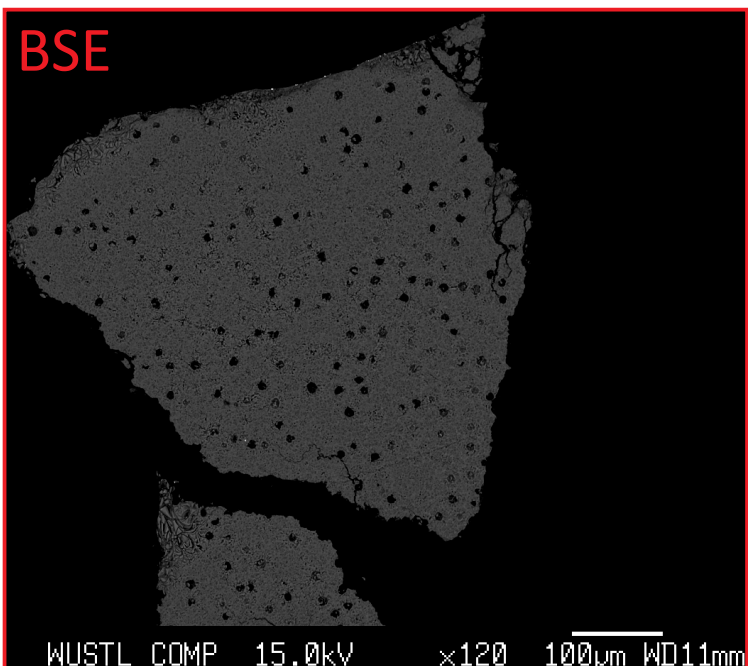
SE



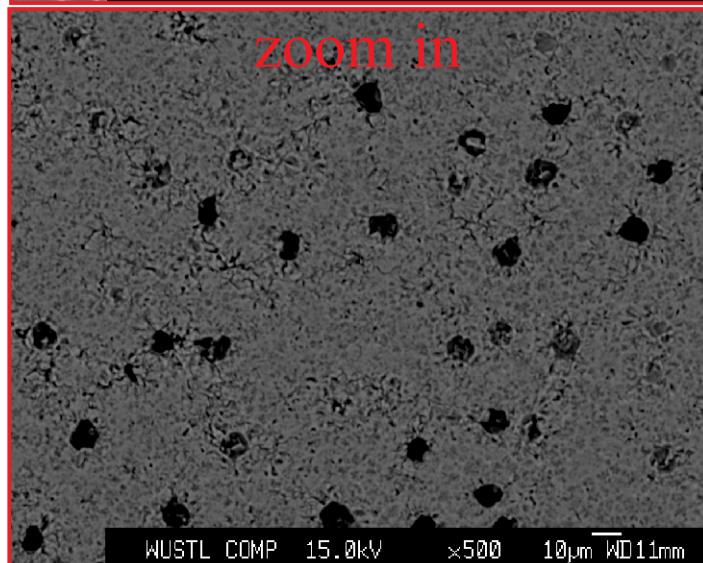
zoom in



BSE

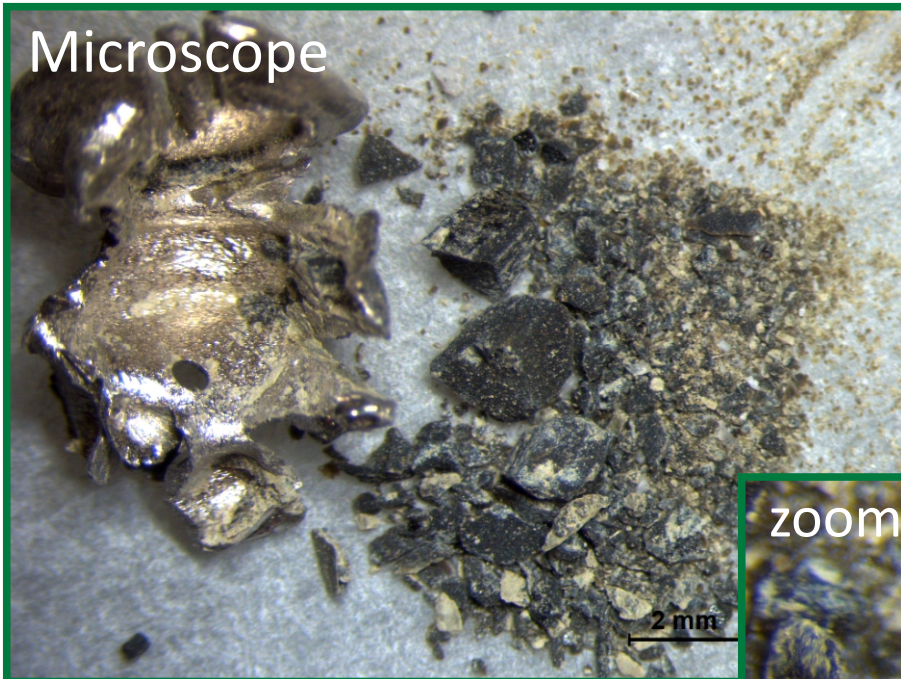


zoom in



(see more BSE images
in the Appendix #2)

Microscope

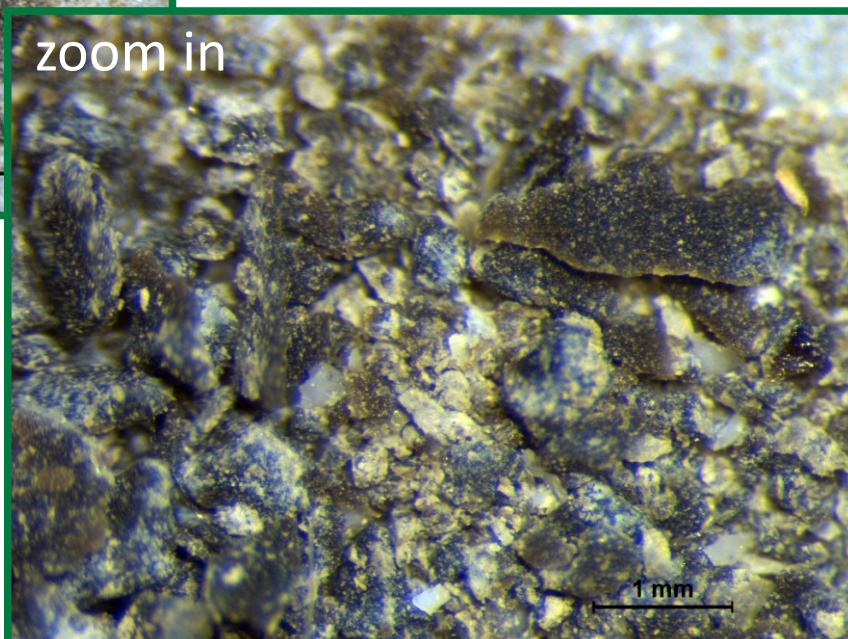


F097

18.5 wt%
of H₂O loaded

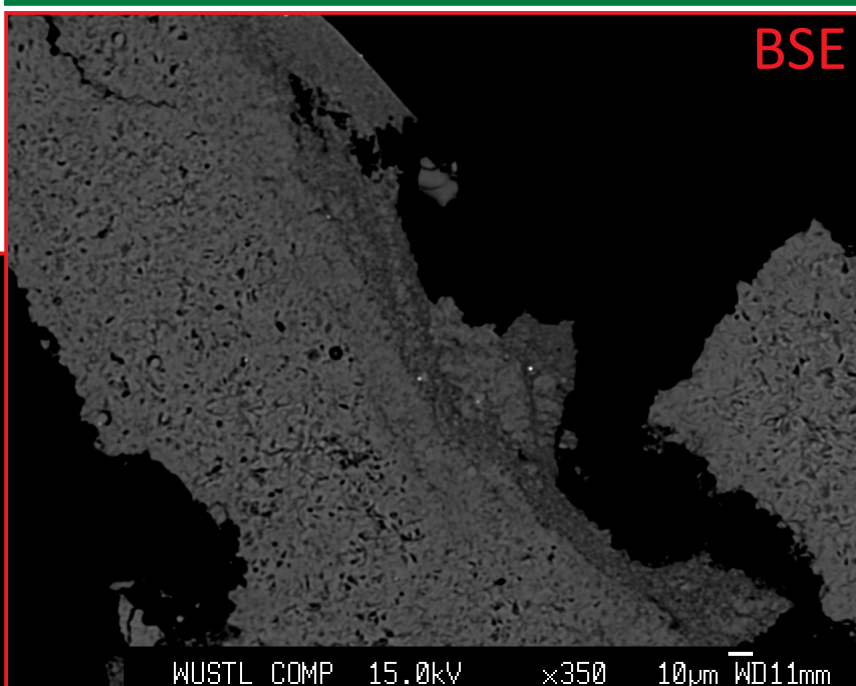
1300°C, 1.5 GPa

zoom in

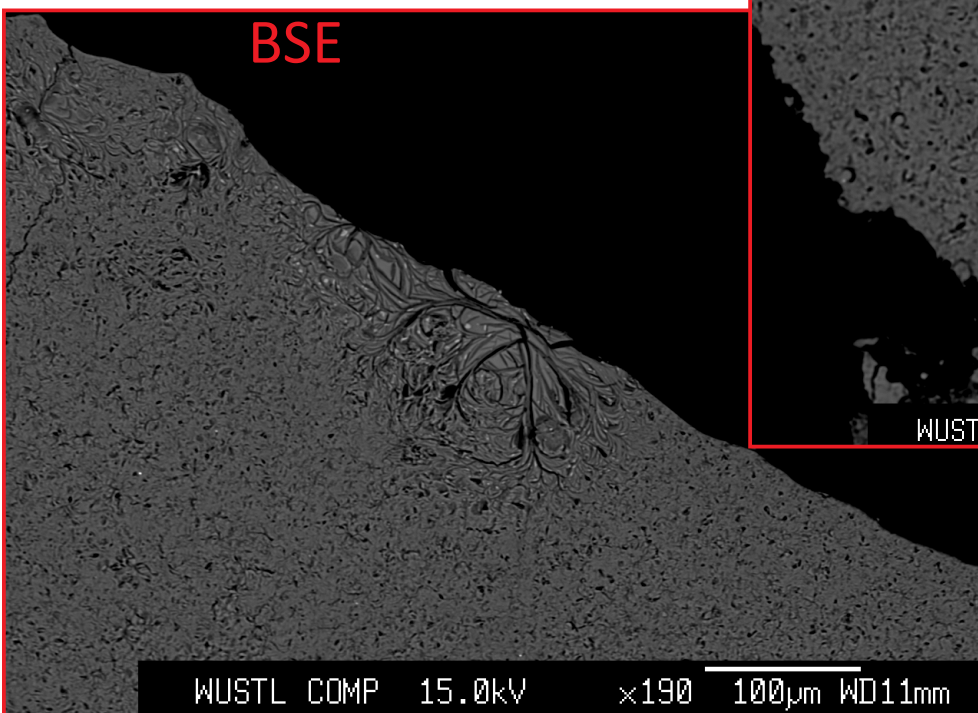


BSE

BSE



WUSTL COMP 15.0kV x190 100µm WD11mm

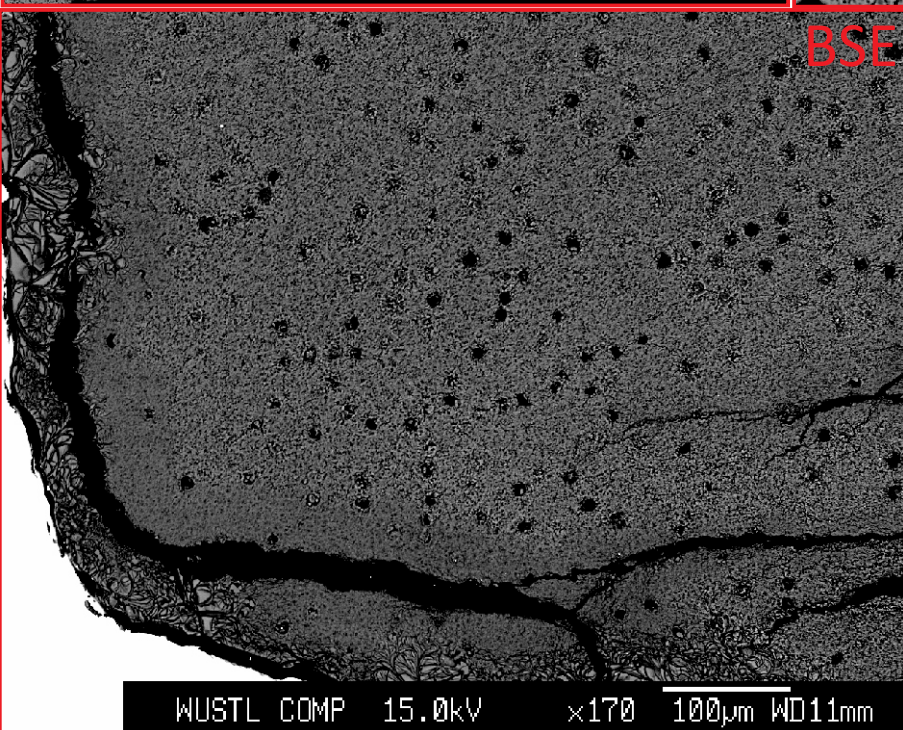
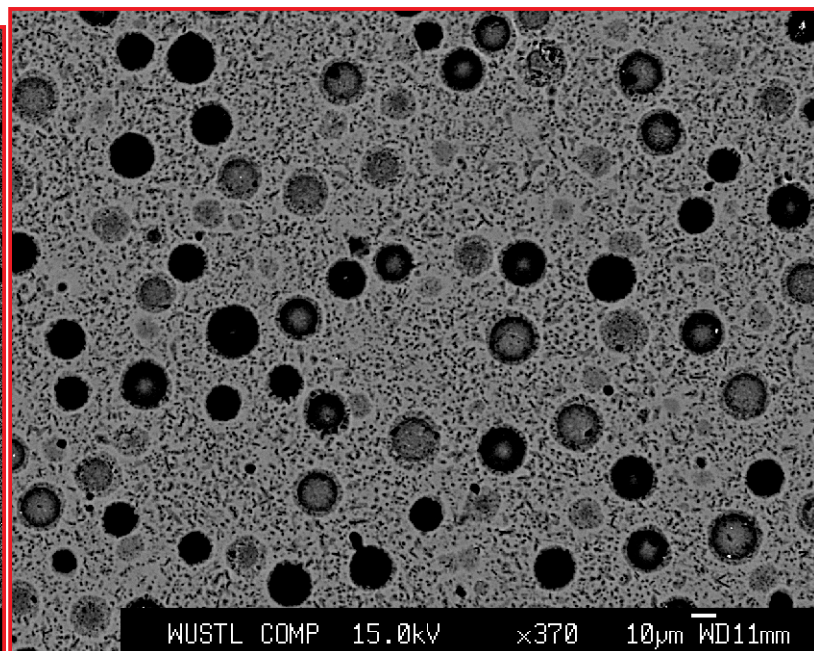
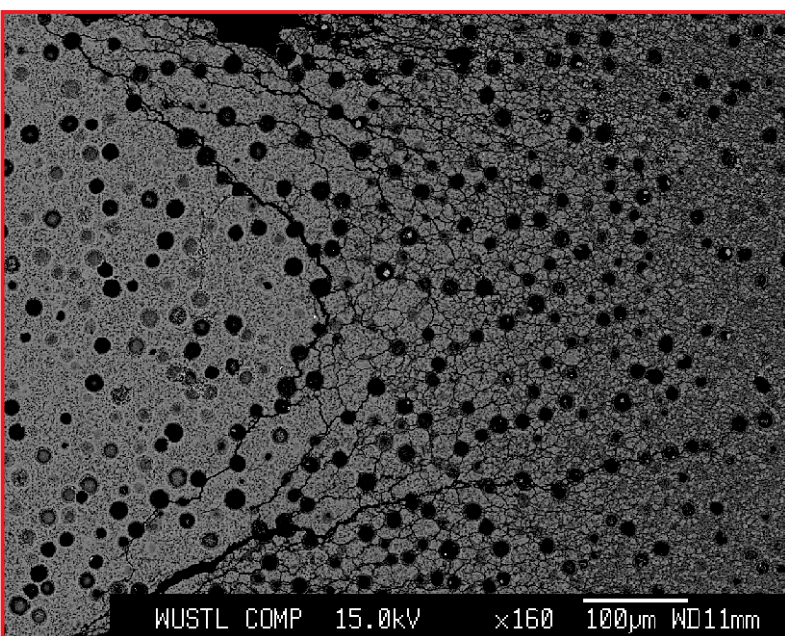


F083

21.3 wt%
of H₂O loaded

1225°C, 1.0 GPa

Microscope



BSE