

Transmitted
Light



2000 μm

Coal 9 Thin Section

Fabric defined by:

- Lenses and layers of coarser-grained material (lighter areas)
- Lenses and layers of finer-grained material (darker areas)
- Linear or globular black alteration zones
- Discrete fractures (some filled, some open)

Reflected
Light



2000 μm

Transmitted
Light

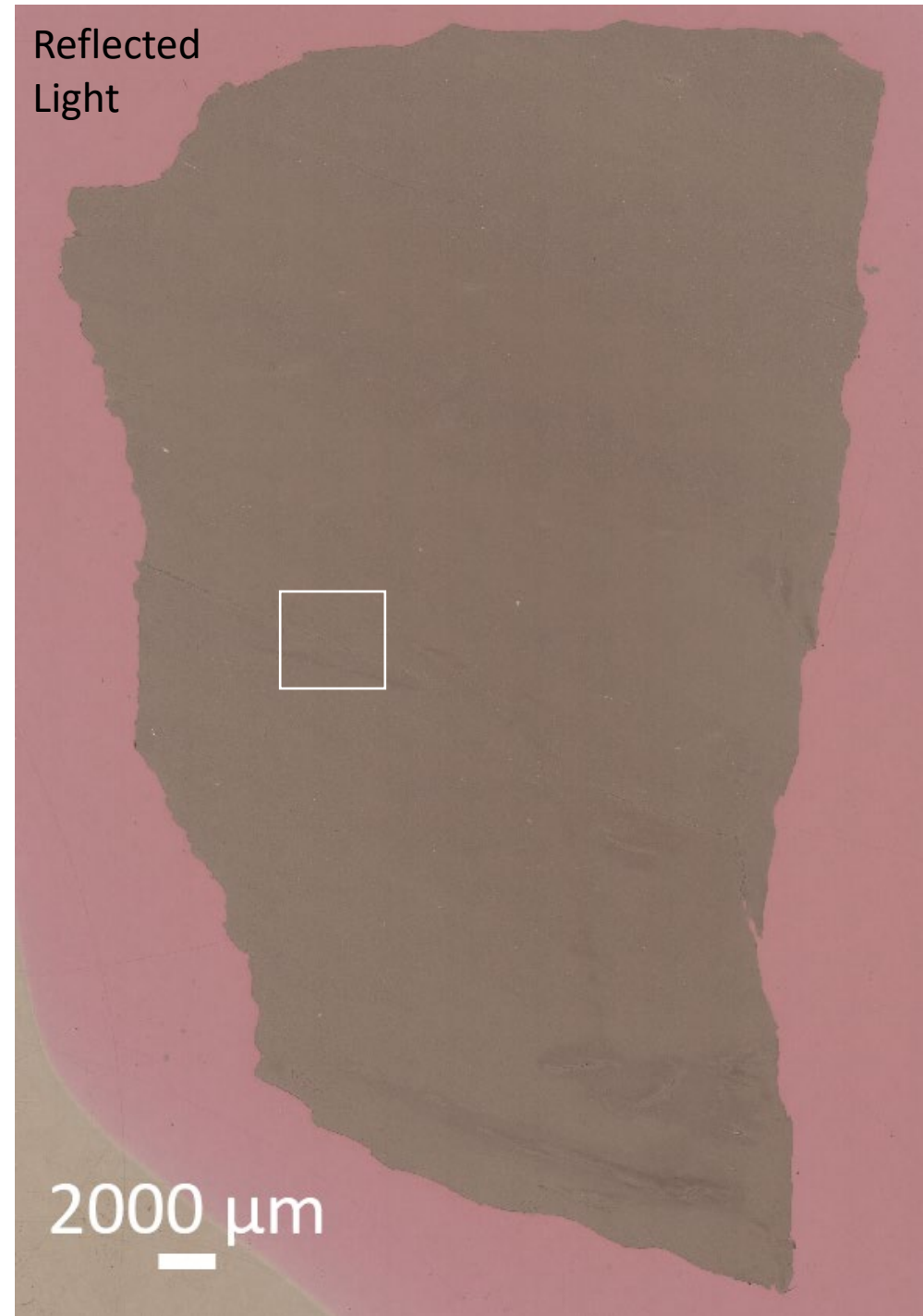


Coal 9 Thin Section

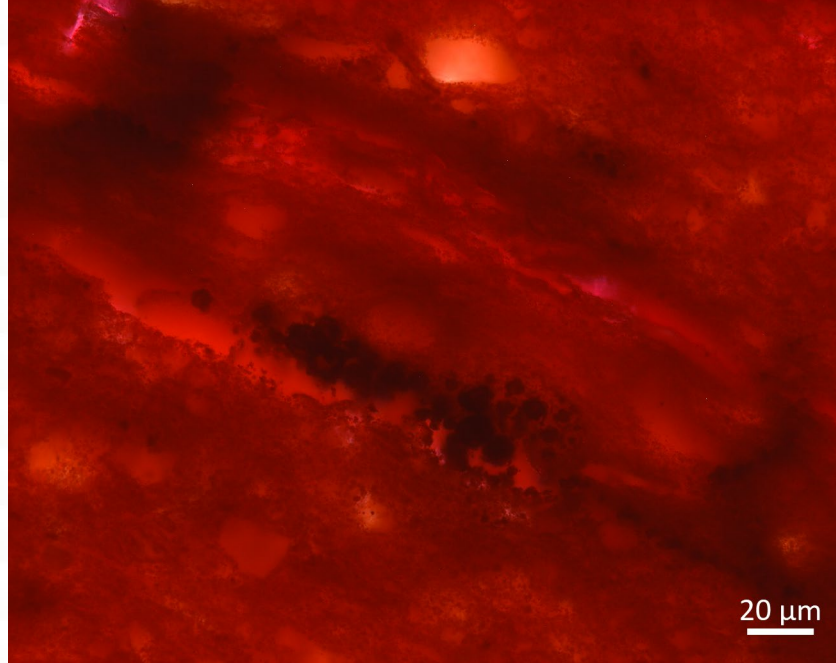
Fabric defined by:

- Lenses and layers of coarser-grained material (lighter areas)
- Lenses and layers of finer-grained material (darker areas)
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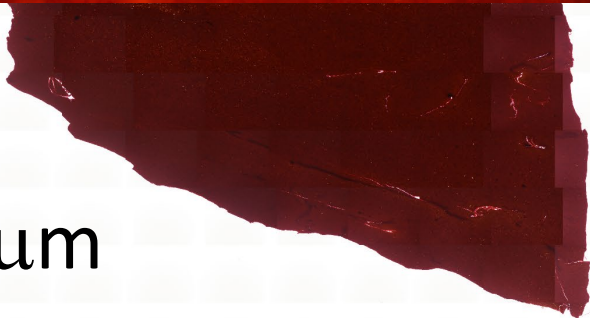
Reflected
Light



Transmitted
Light



2000 μm

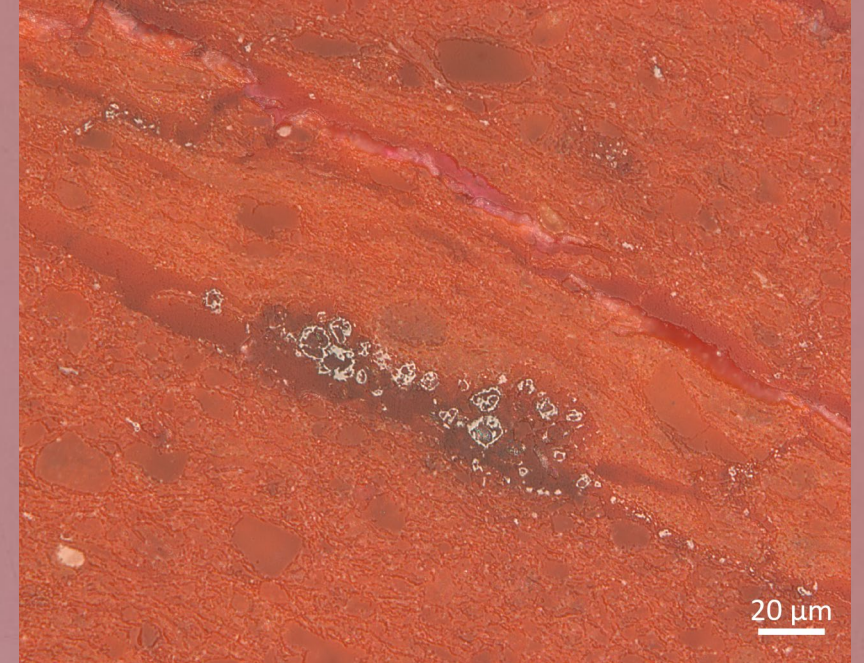


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Fabric defined by:

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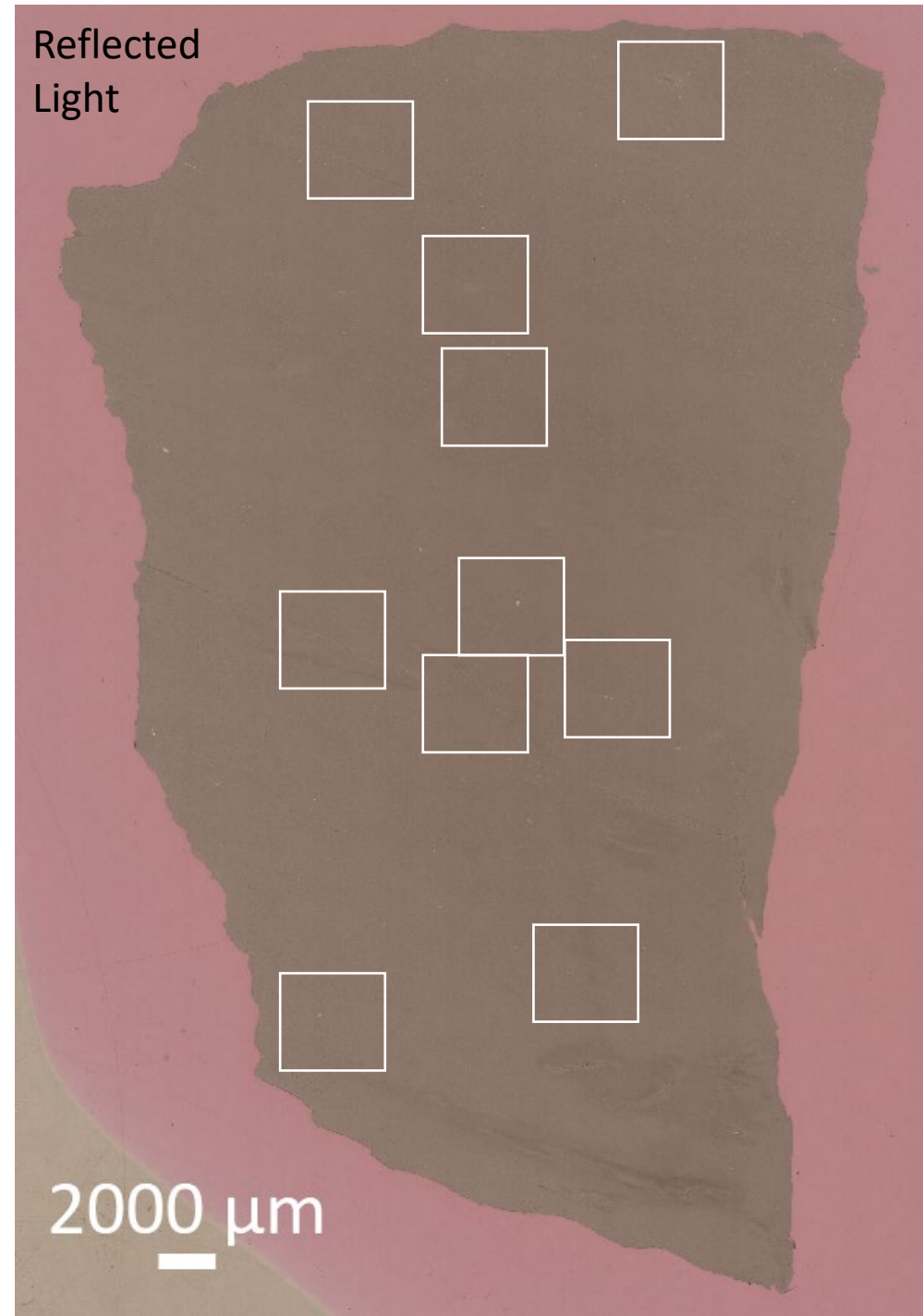
2000 μm

Coal 9 Thin Section

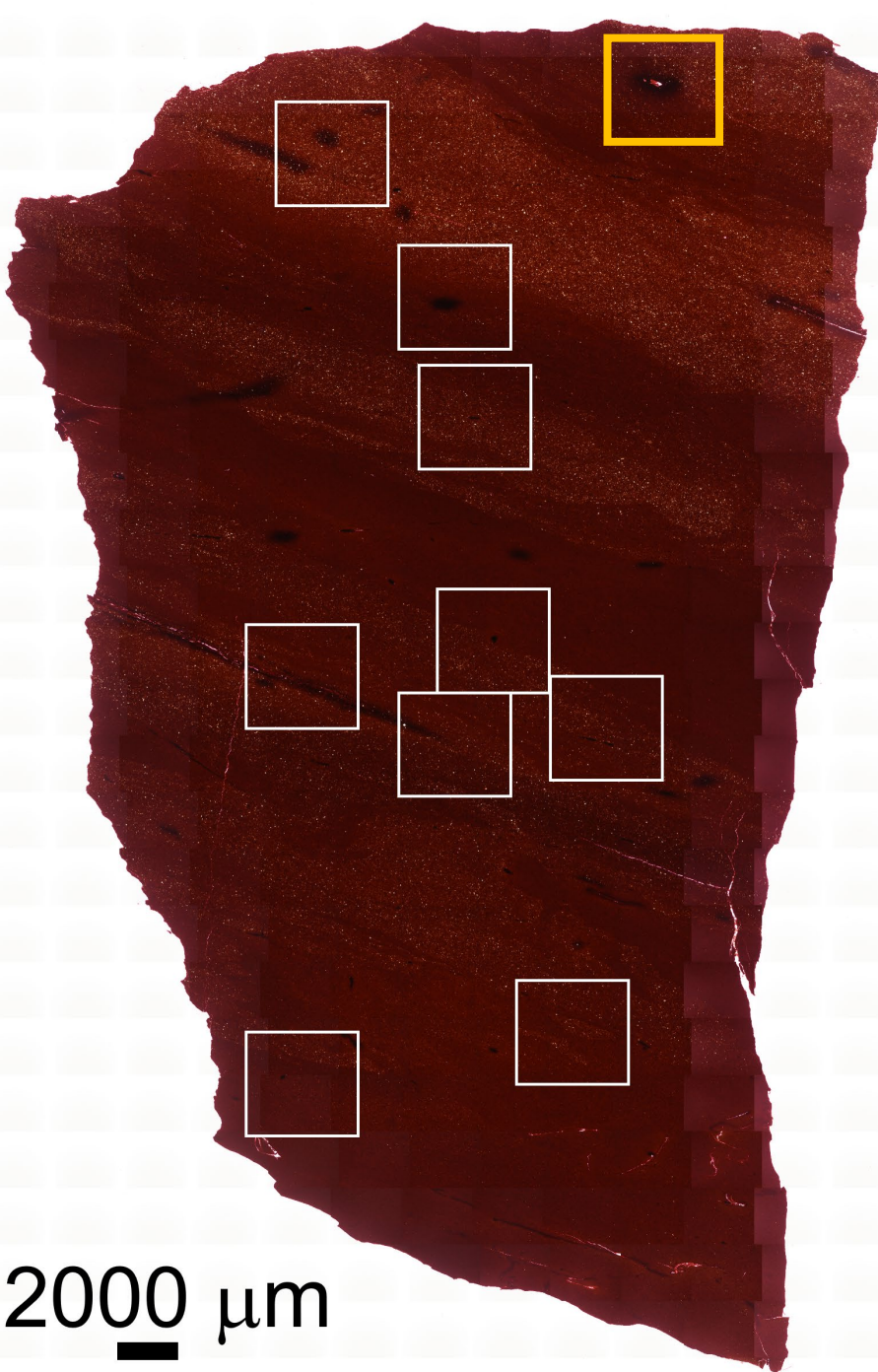
Optical and Scanning
Electron Microscopy ROI's
show detail for:

- Black alteration zones
- Fracture fill and tip zones
- Grains that define coarse- vs. fine-grained zones

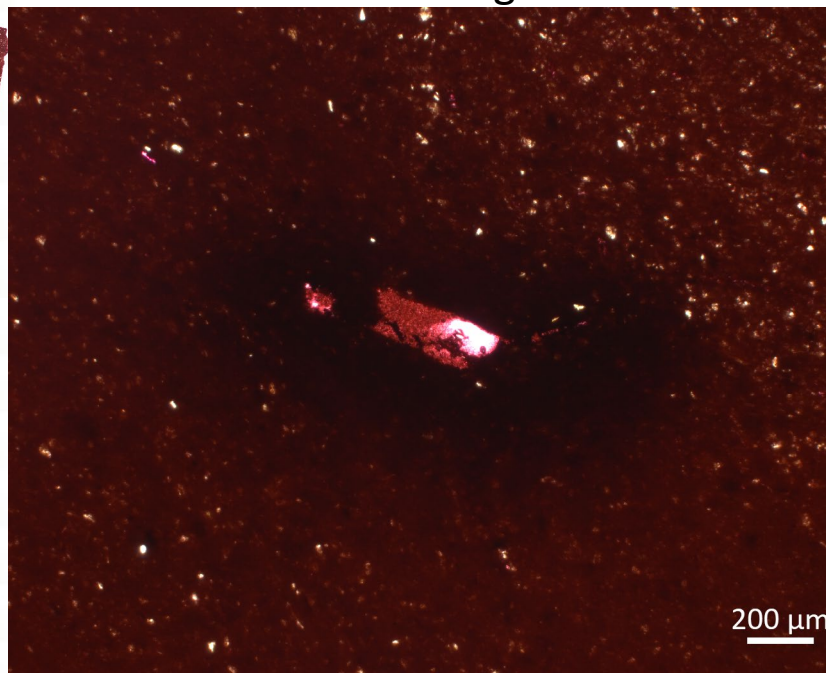
Reflected
Light



2000 μm



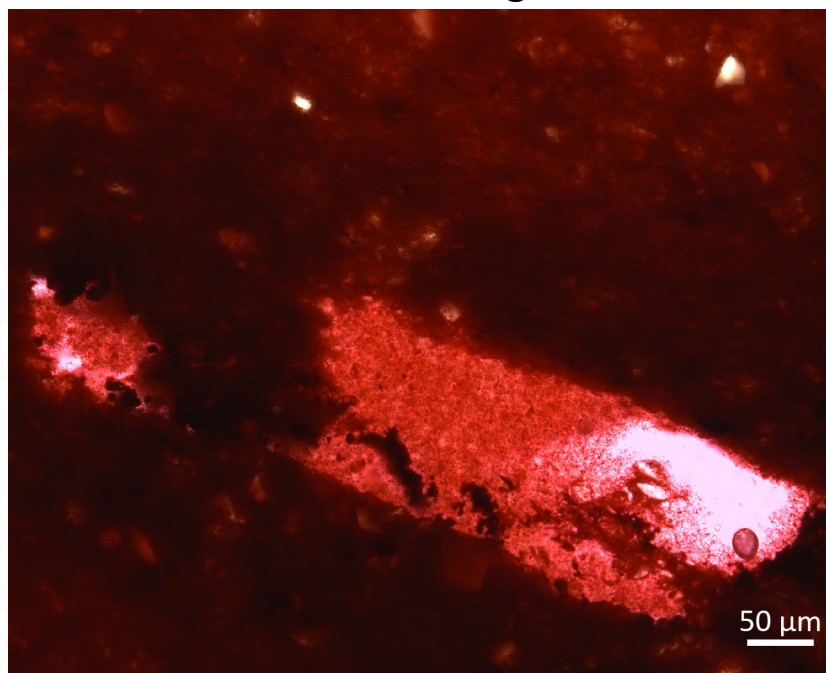
Transmitted Light



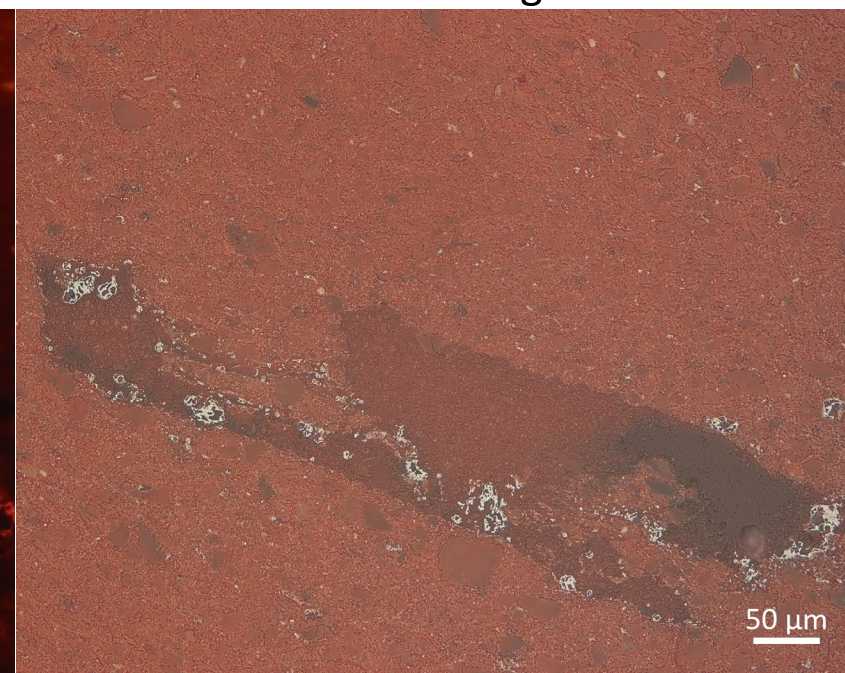
Reflected Light

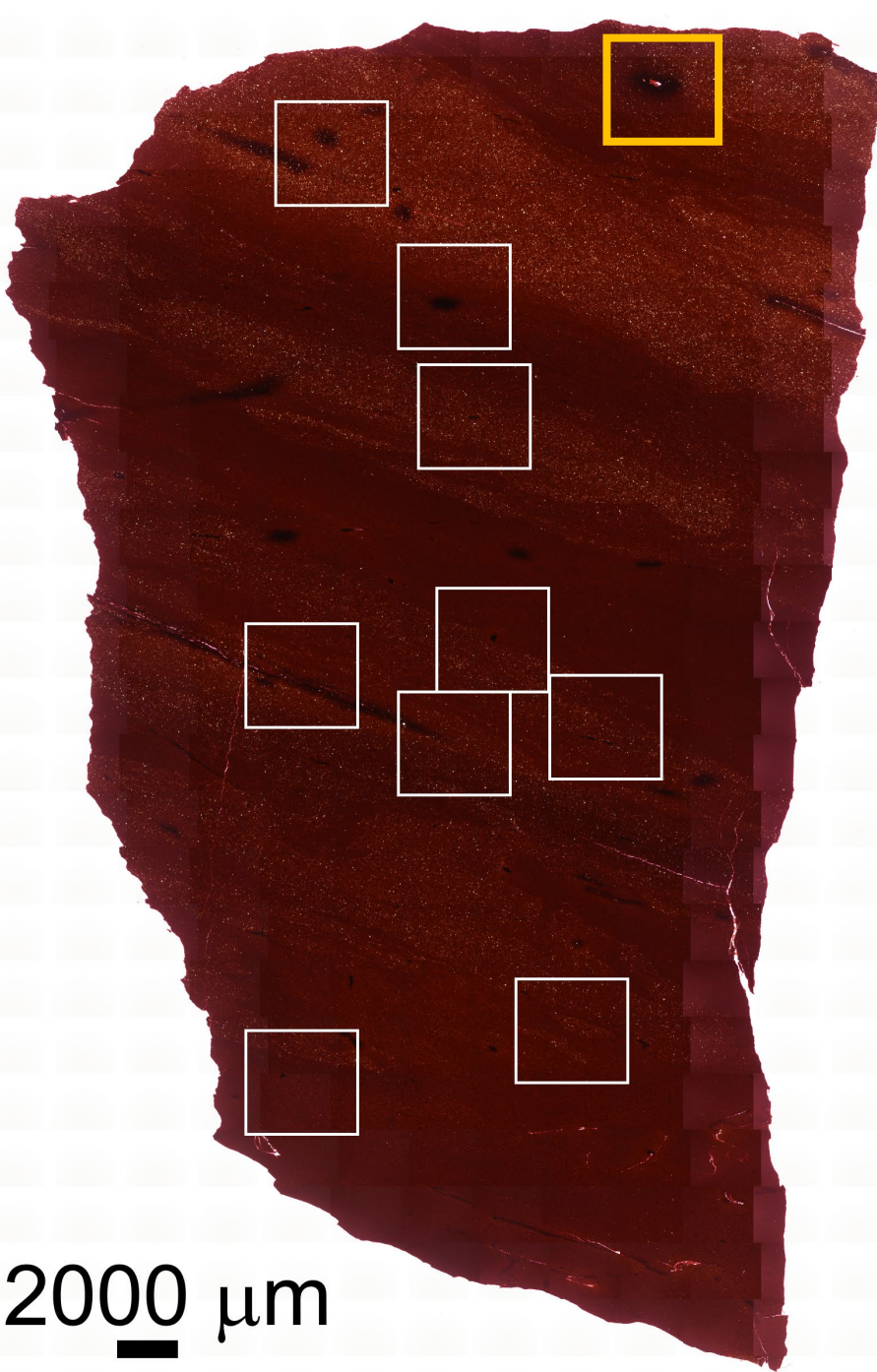


Transmitted Light

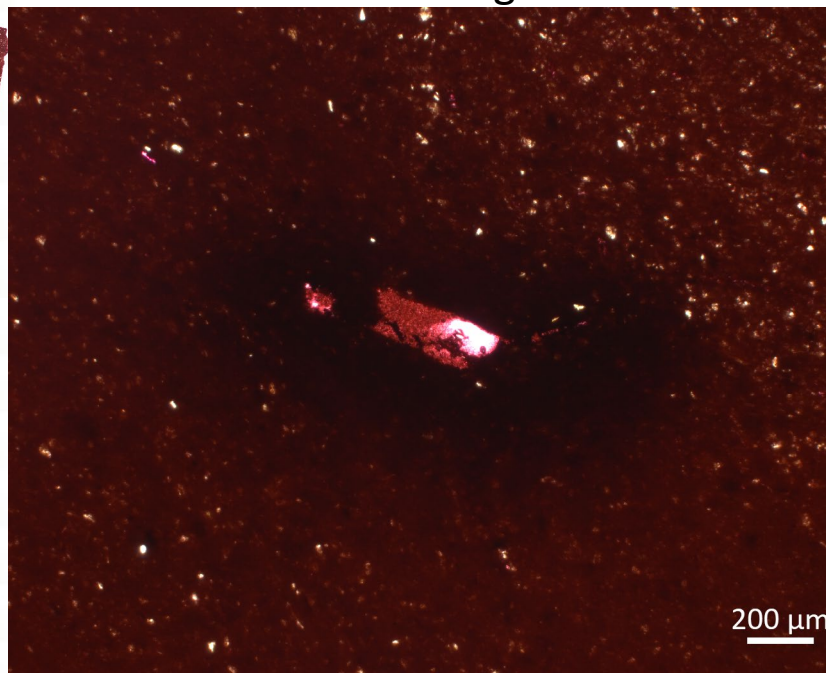


Reflected Light

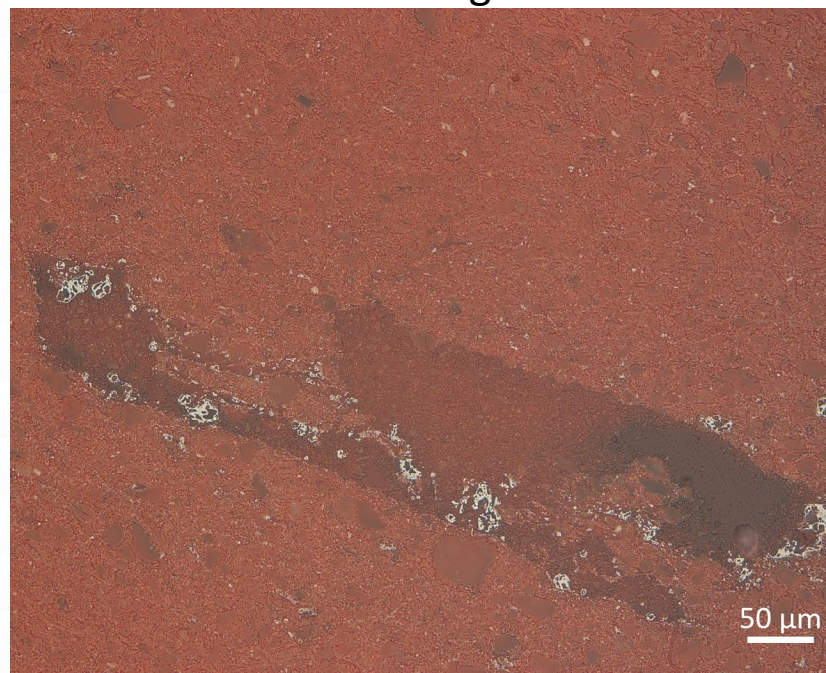




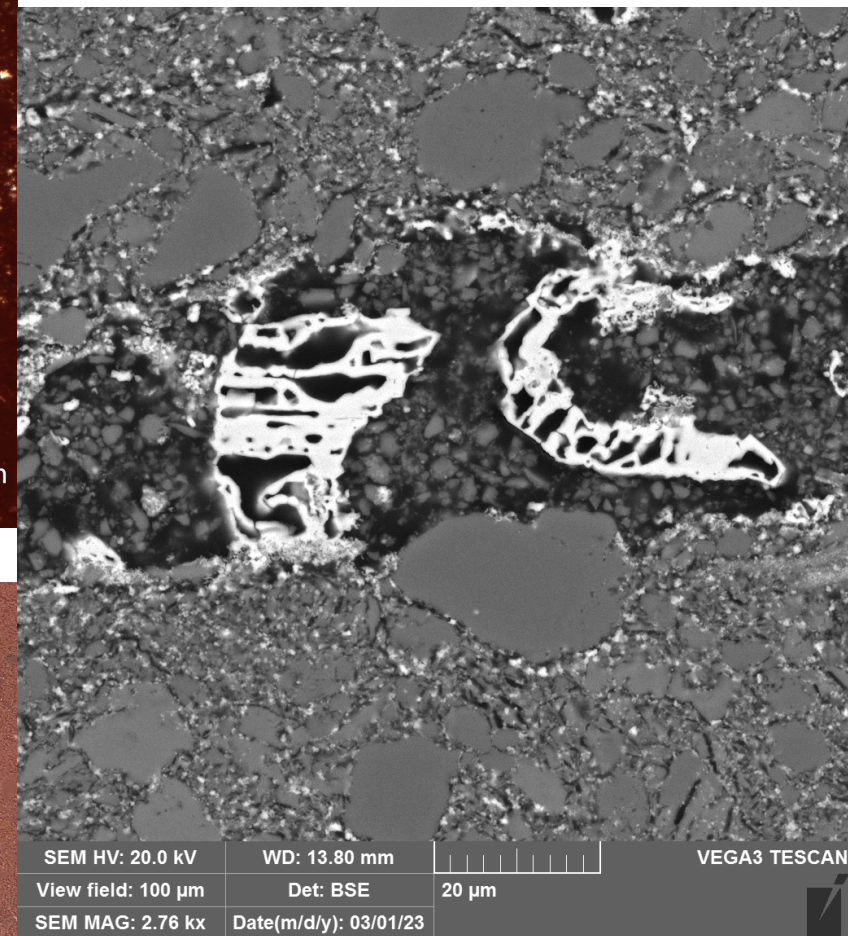
Transmitted Light

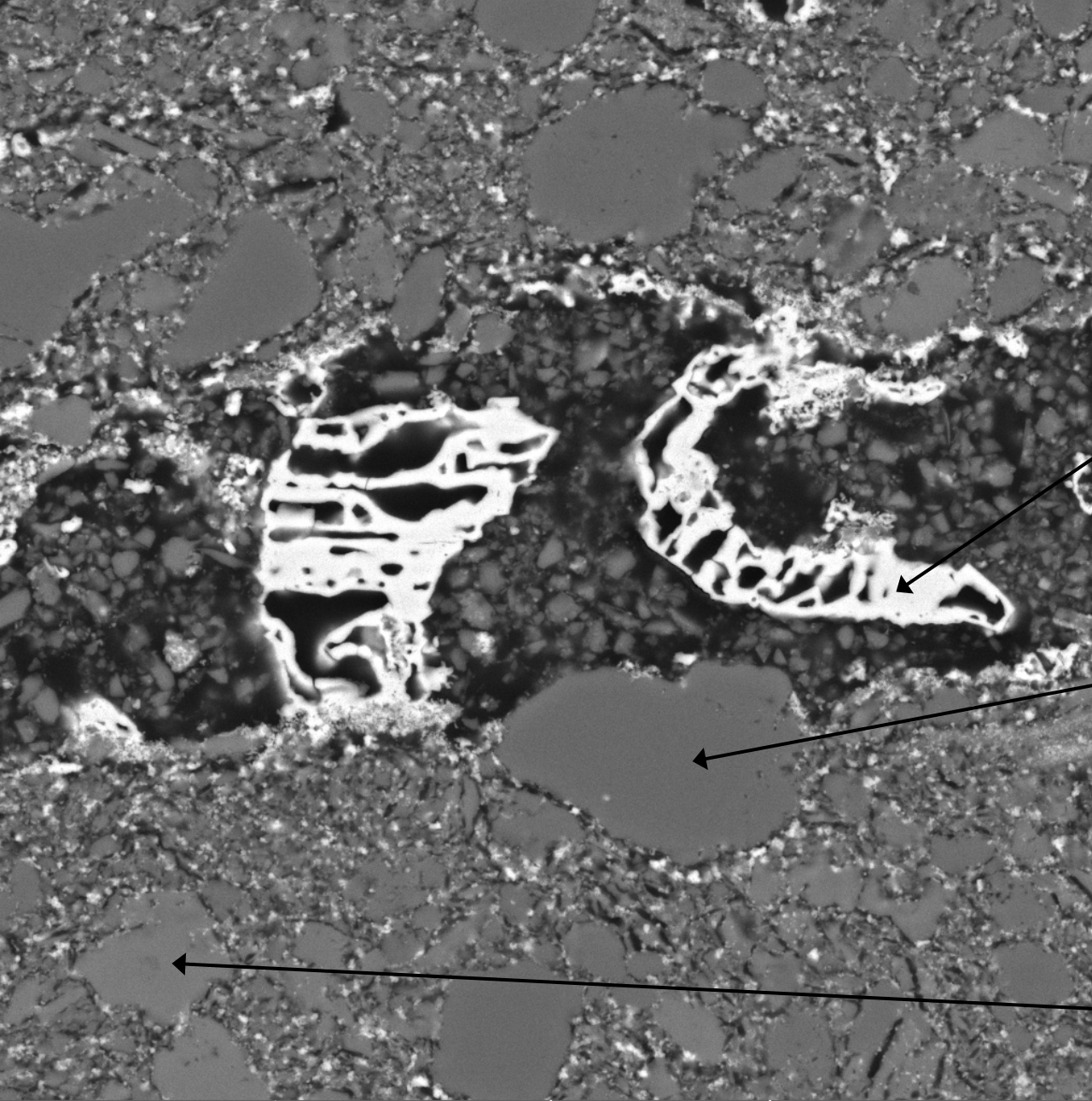


Reflected Light



SEM: Backscattered Electron



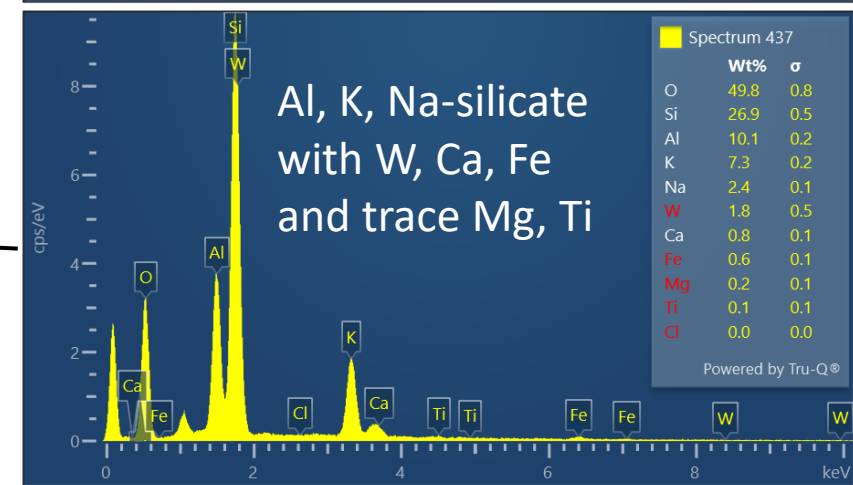
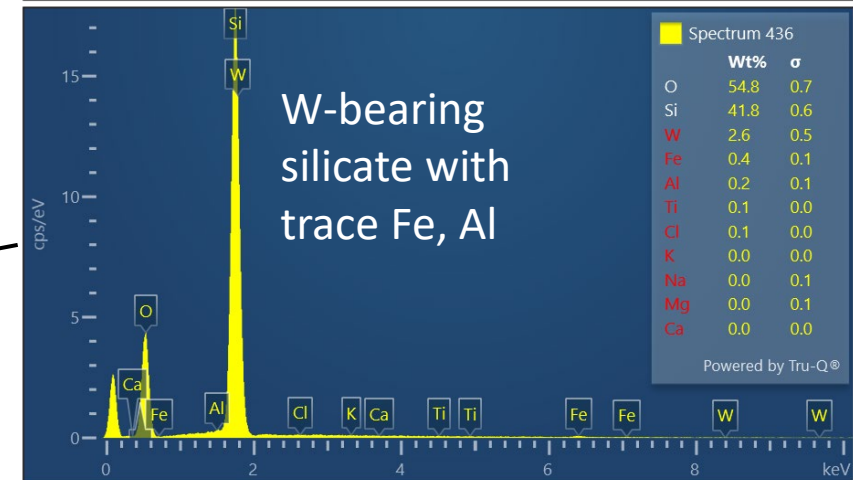
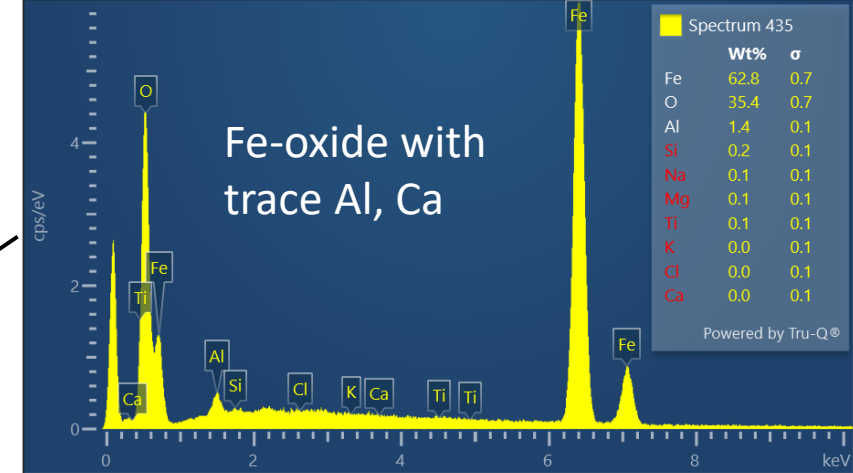


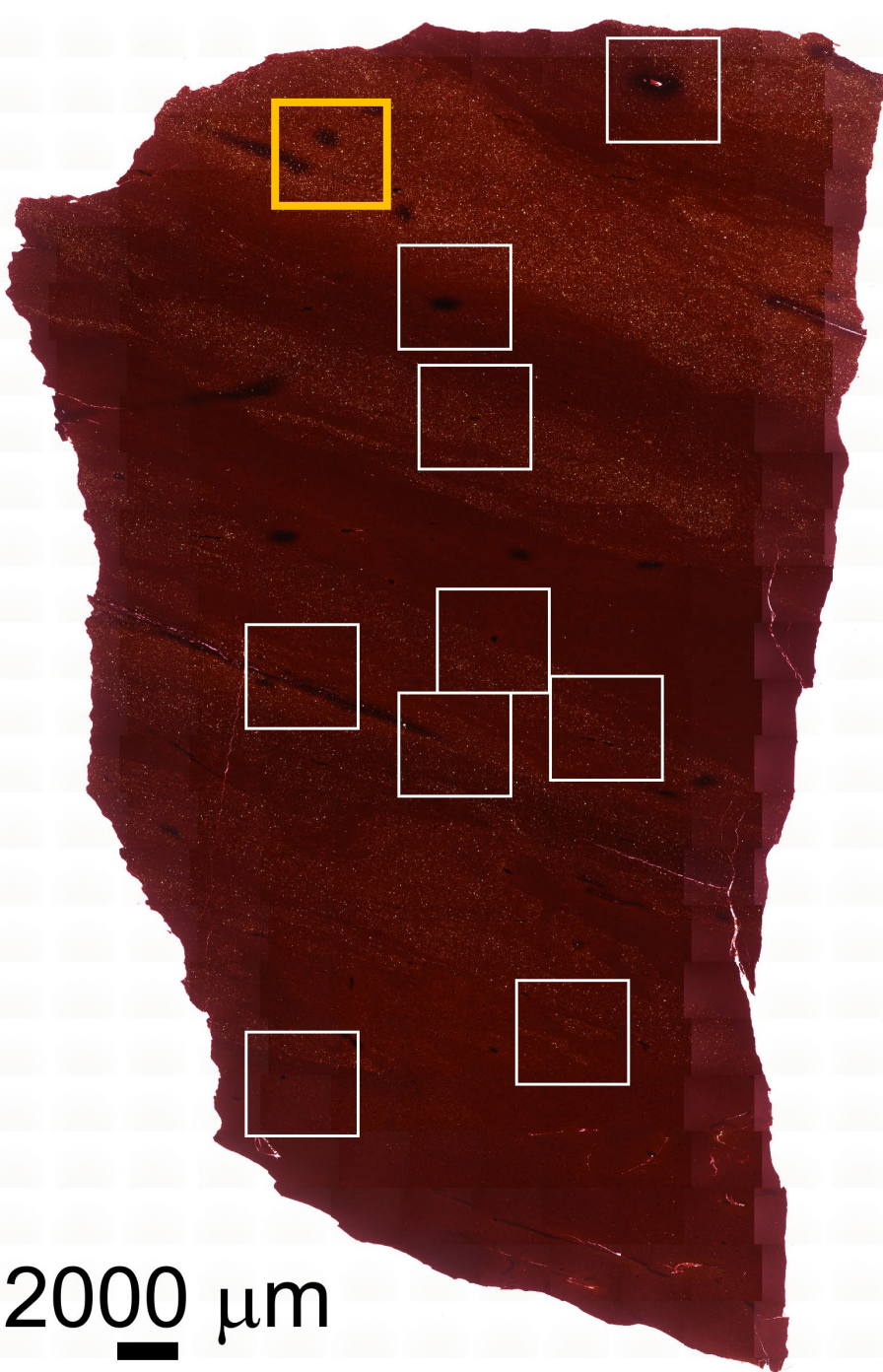
EDS Analyses on
Major Phases in and
surrounding void

Bright skeletal
Fe- oxide in
void

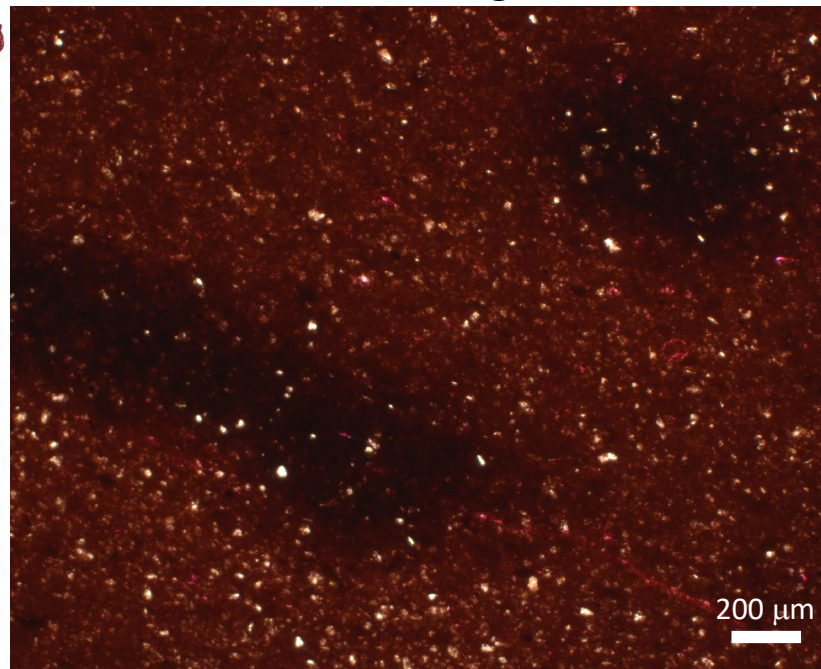
Darker gray, solid
grain in matrix

Moderately bright
gray grain in matrix

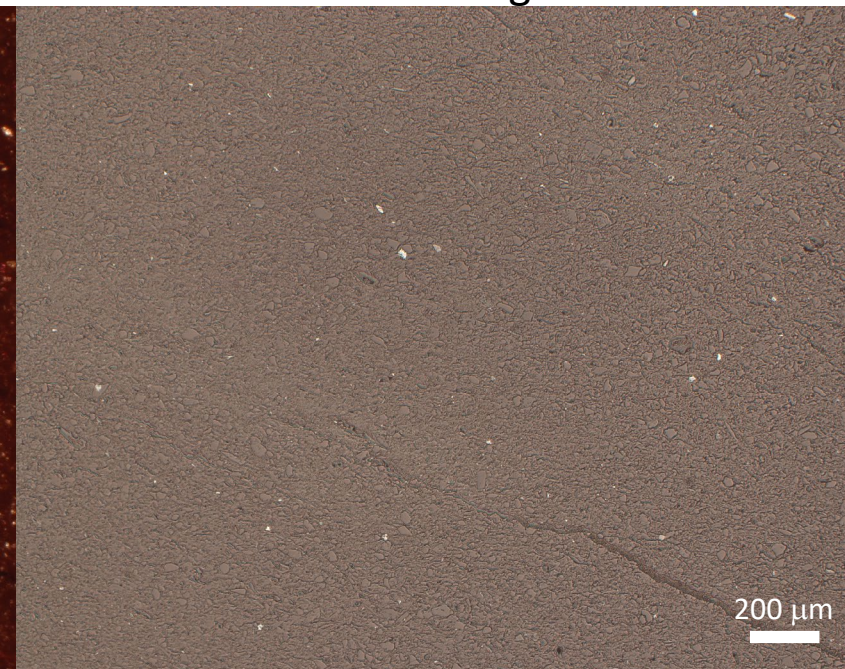




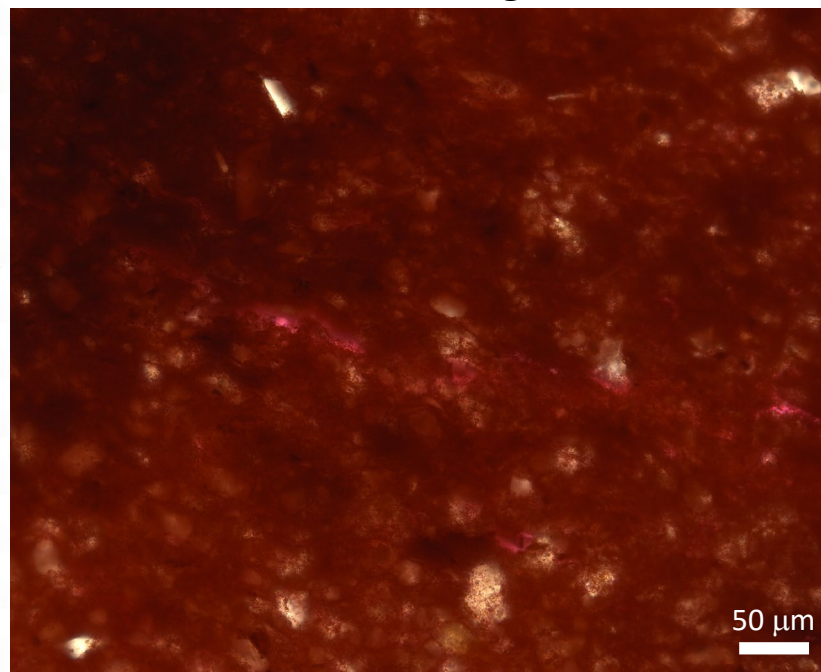
Transmitted Light



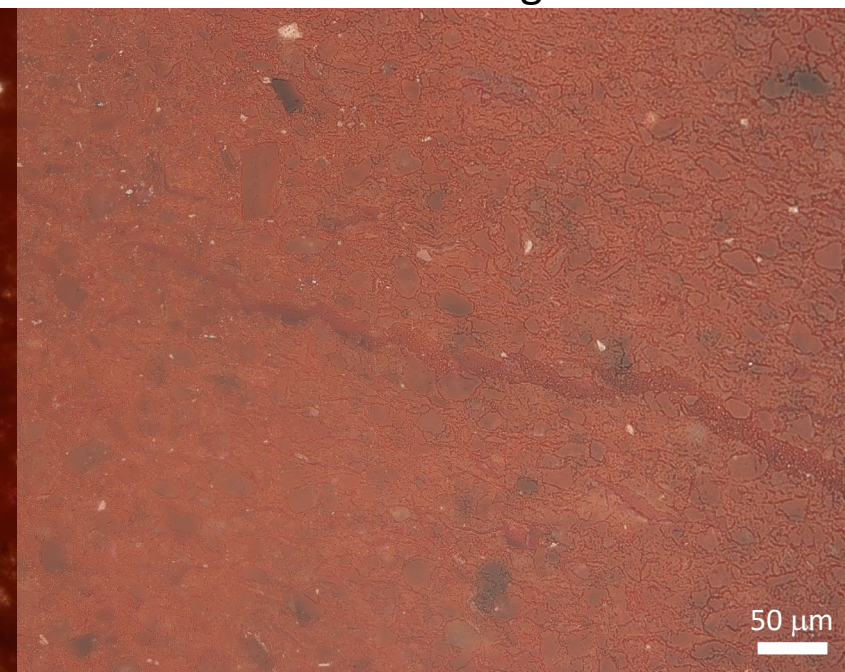
Reflected Light

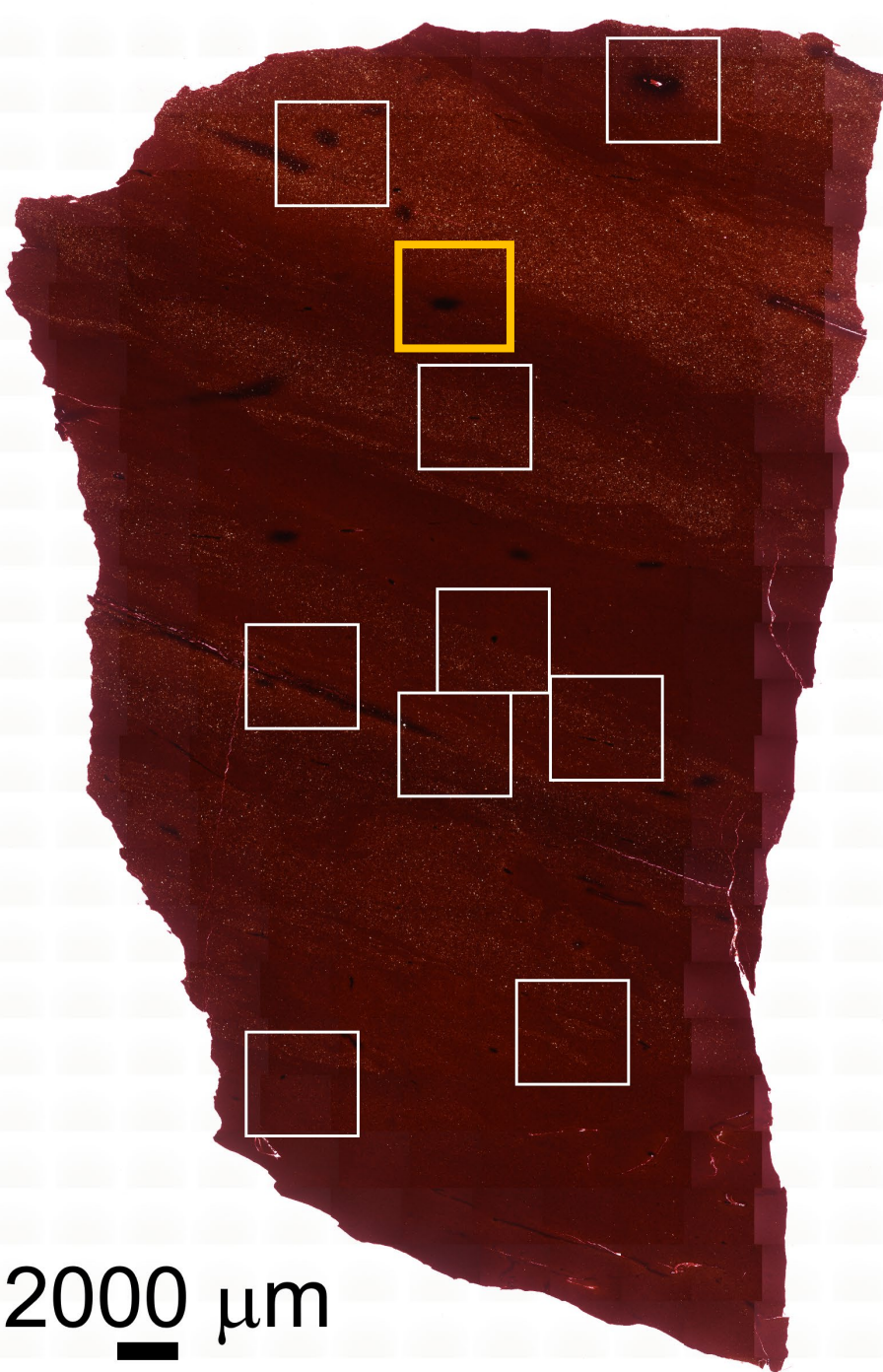


Transmitted Light

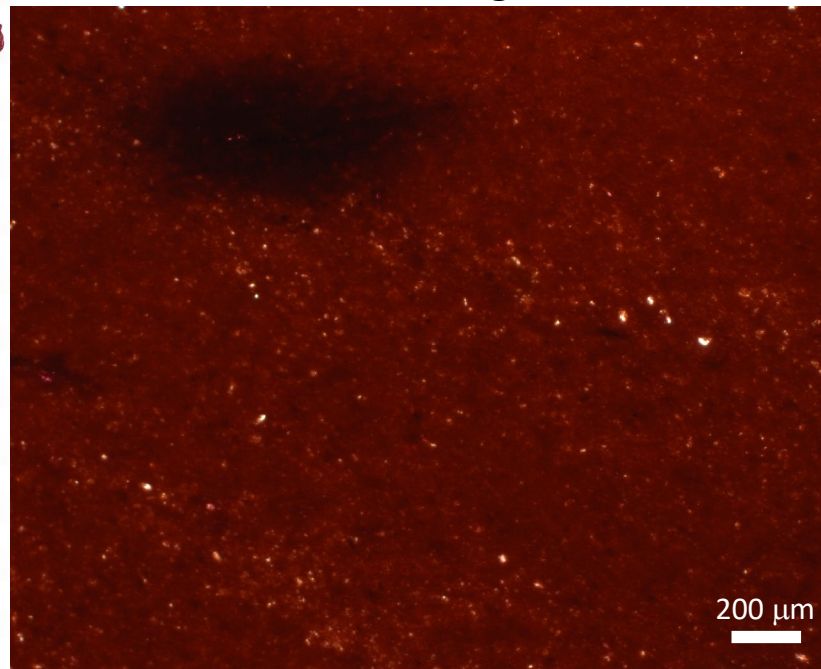


Reflected Light

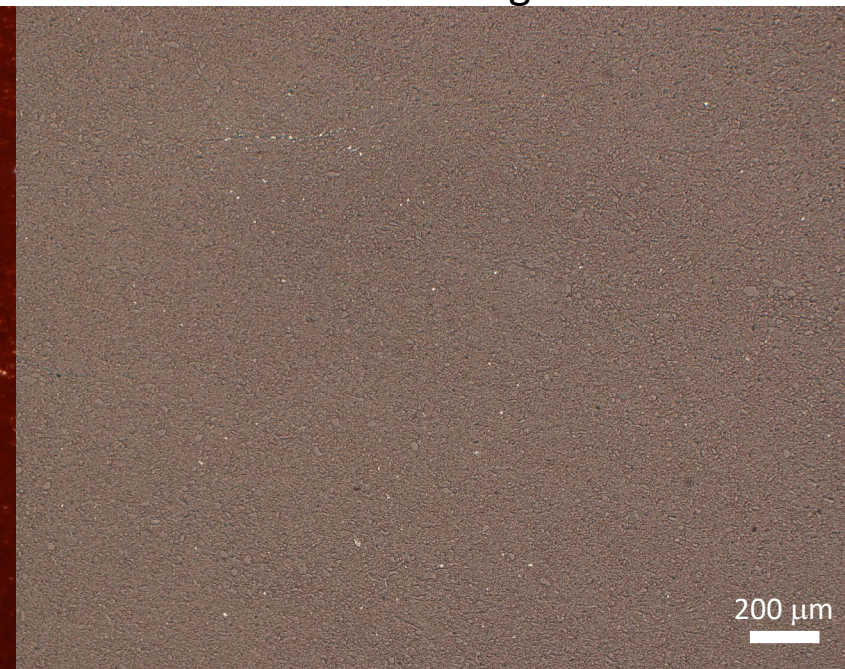




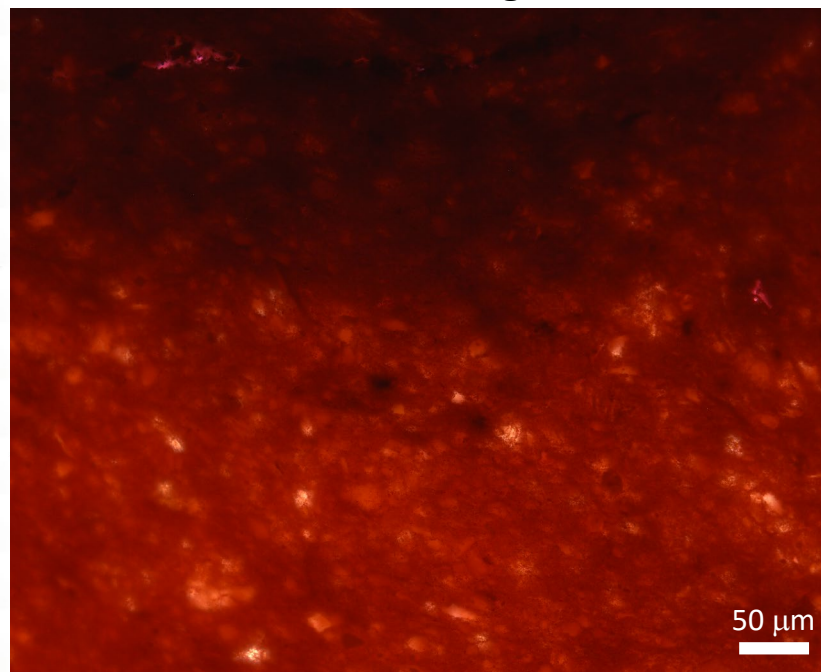
Transmitted Light



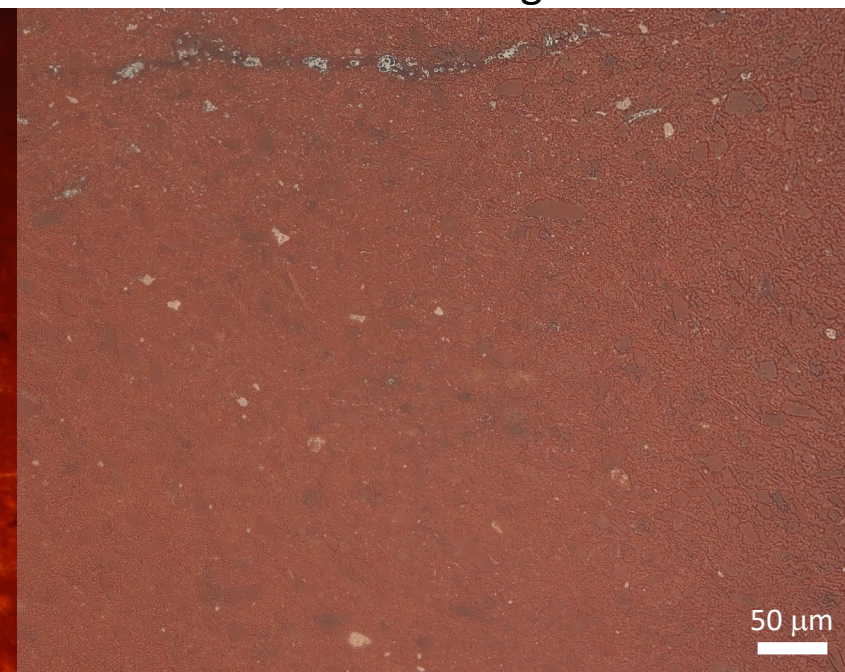
Reflected Light

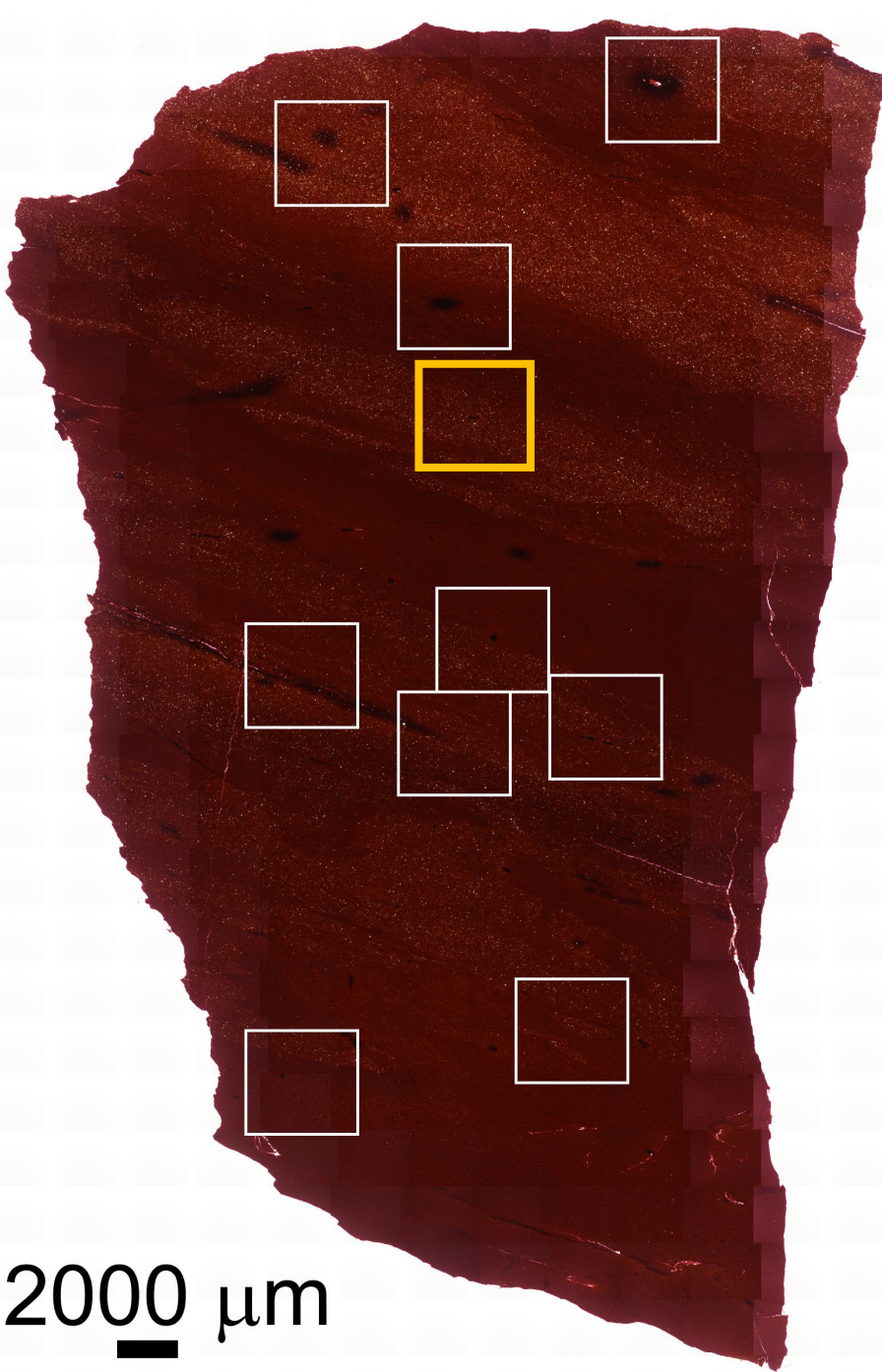


Transmitted Light

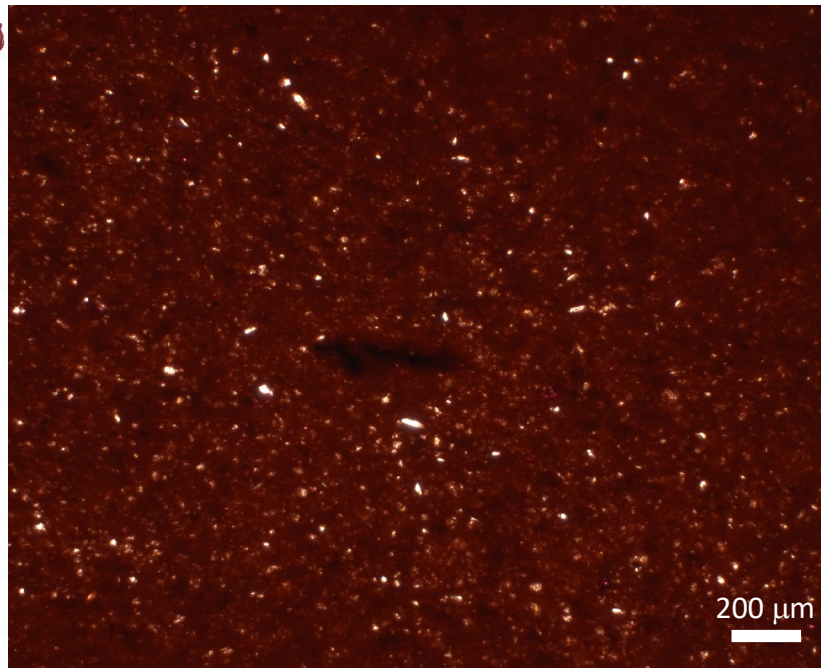


Reflected Light

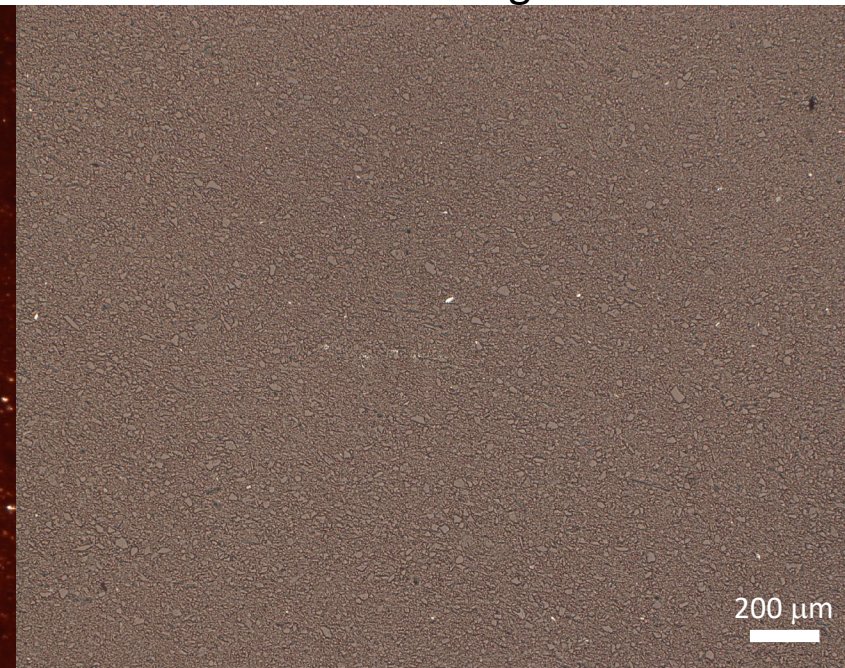




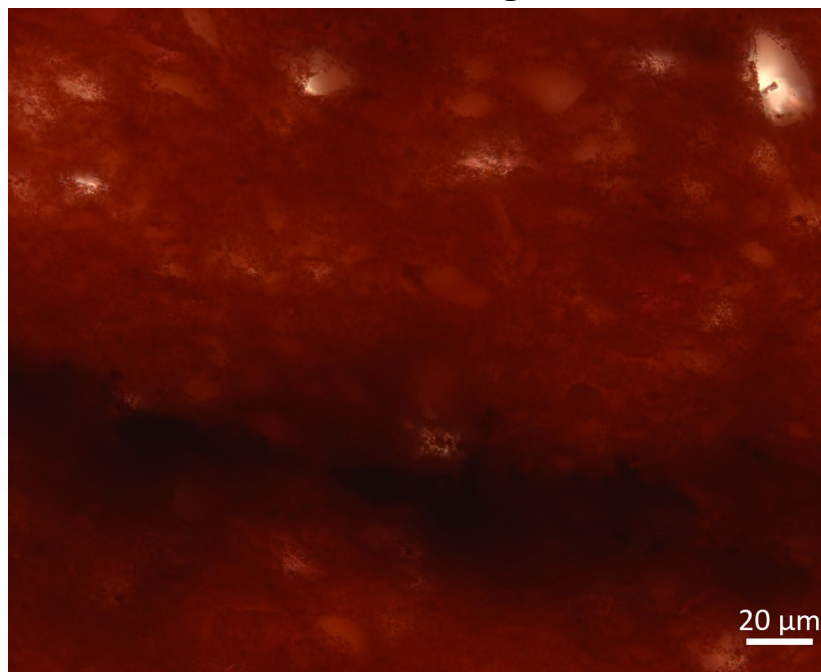
Transmitted Light



Reflected Light

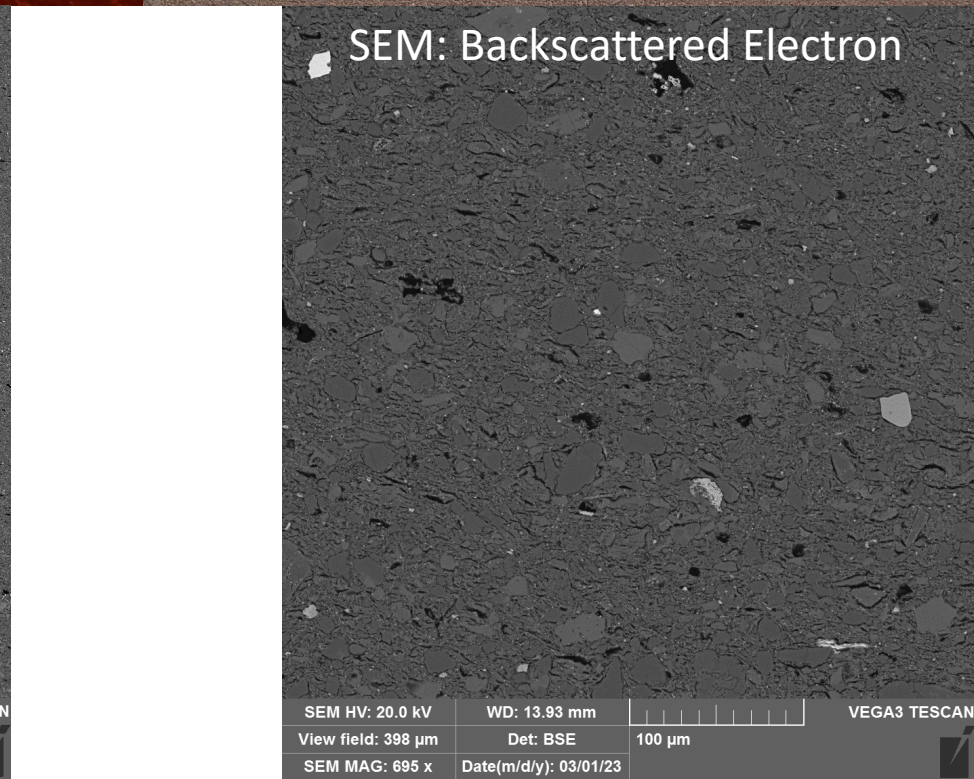
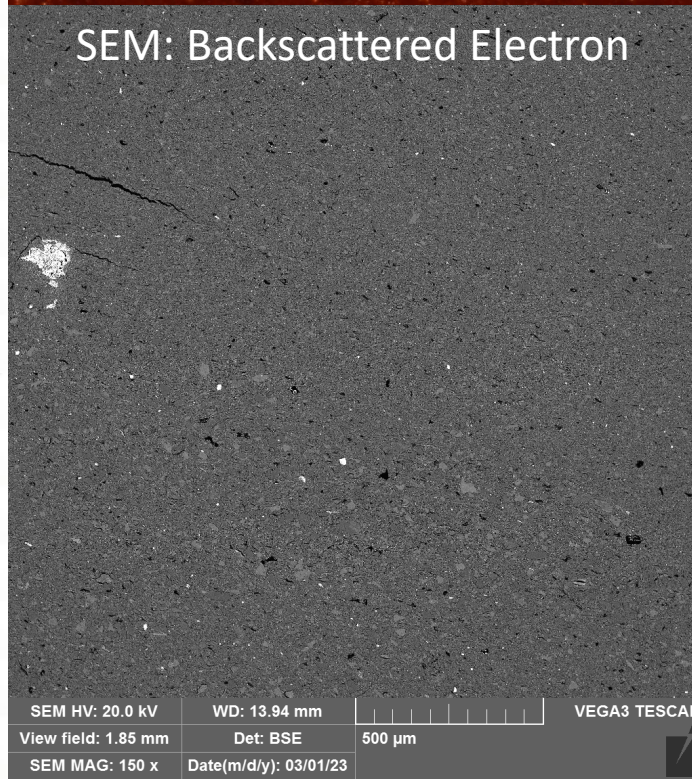
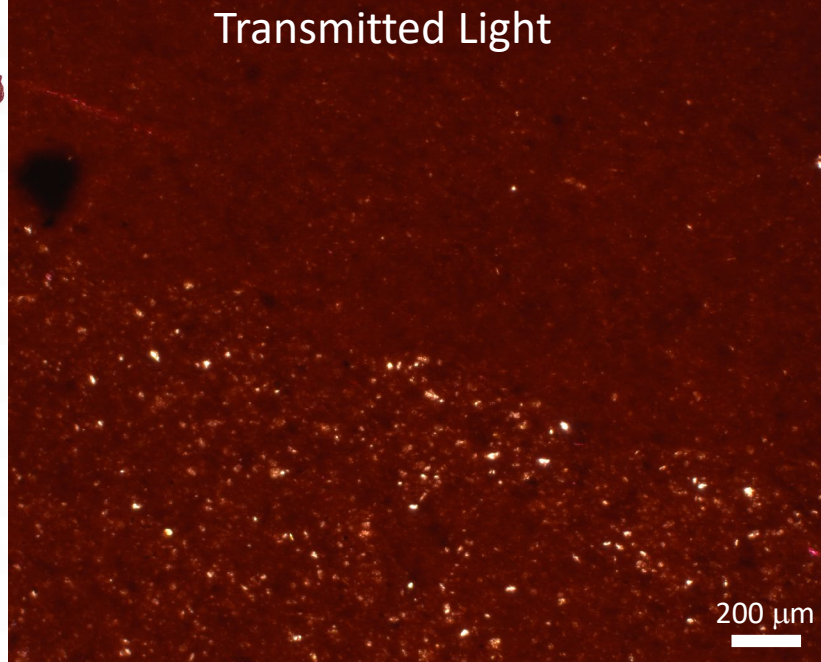


Transmitted Light



Reflected Light





EDS Analyses on distinct phases in matrix

1

6

5

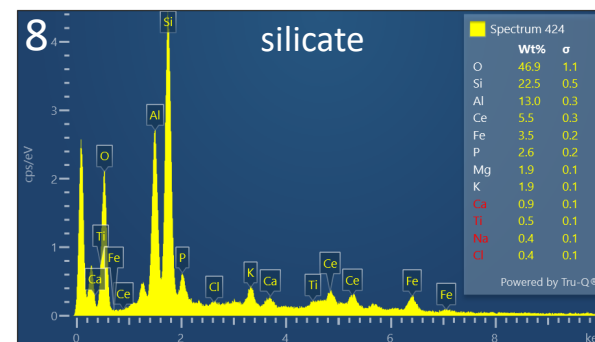
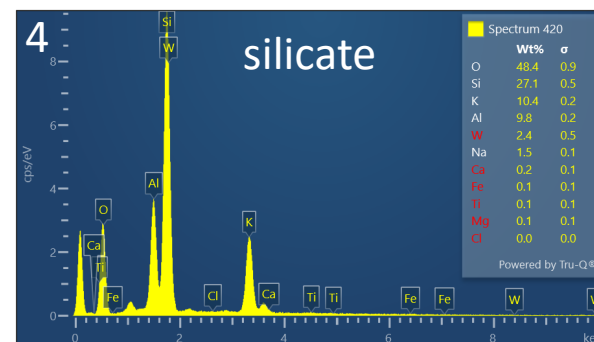
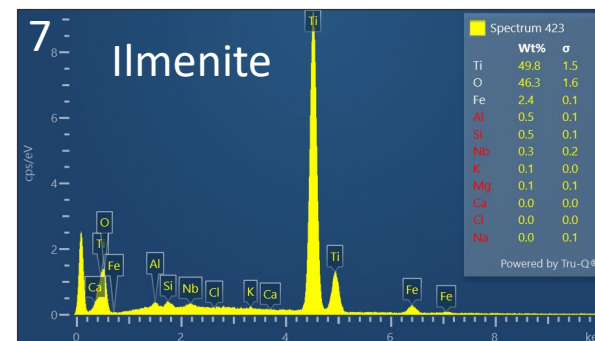
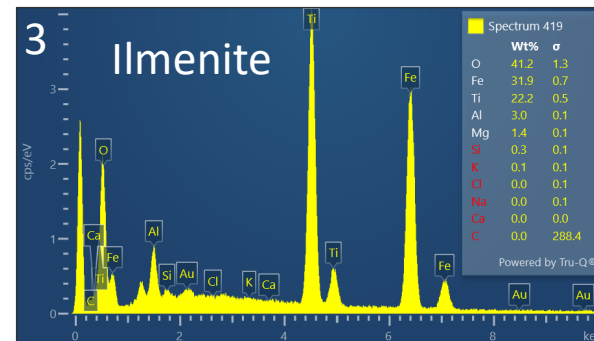
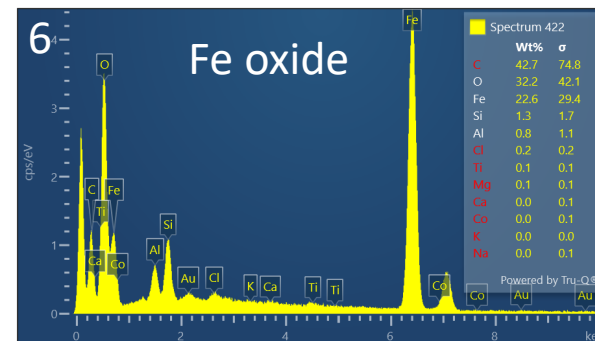
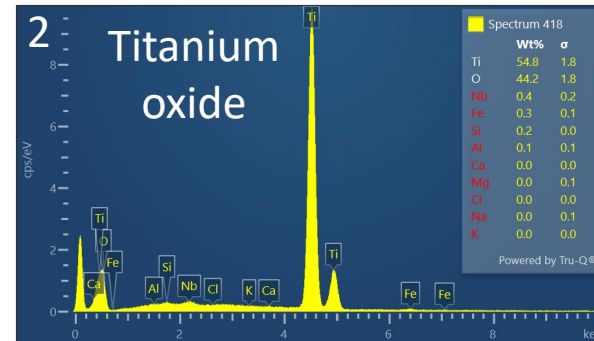
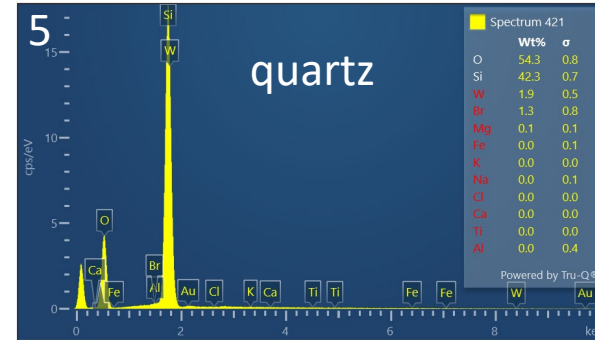
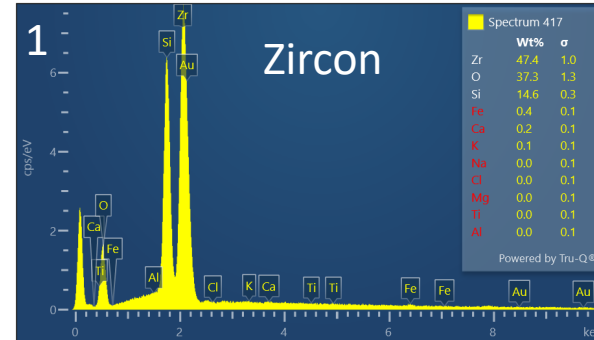
4

2

3

7

8



SEM HV: 20.0 kV

WD: 13.93 mm

VEGA3 TESCAN

View field: 398 μ m

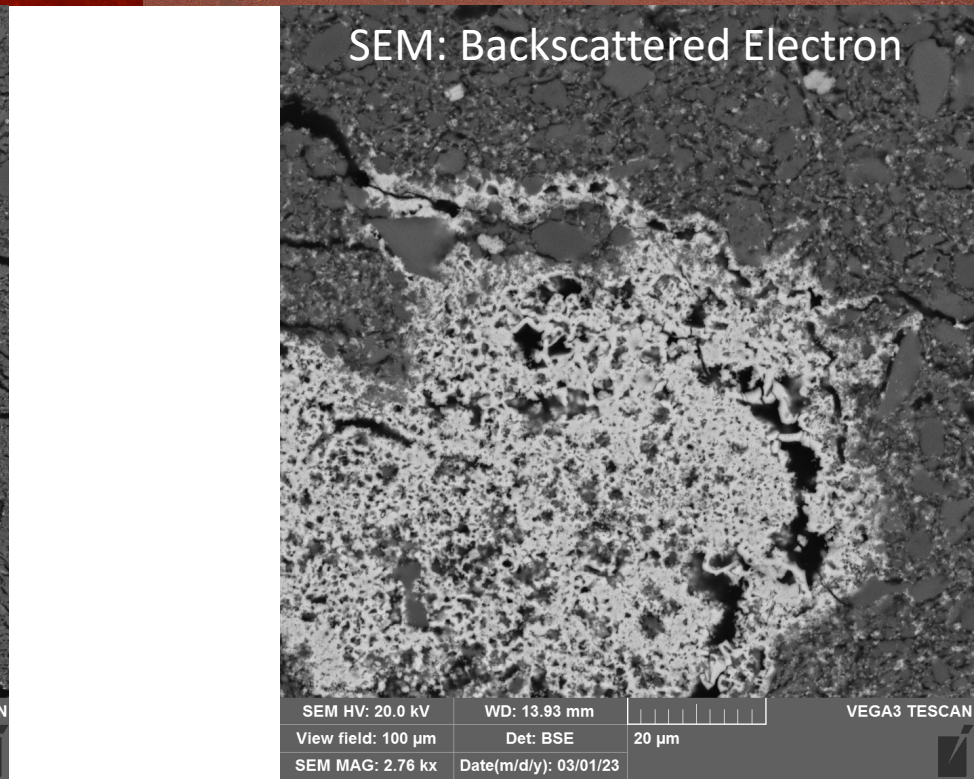
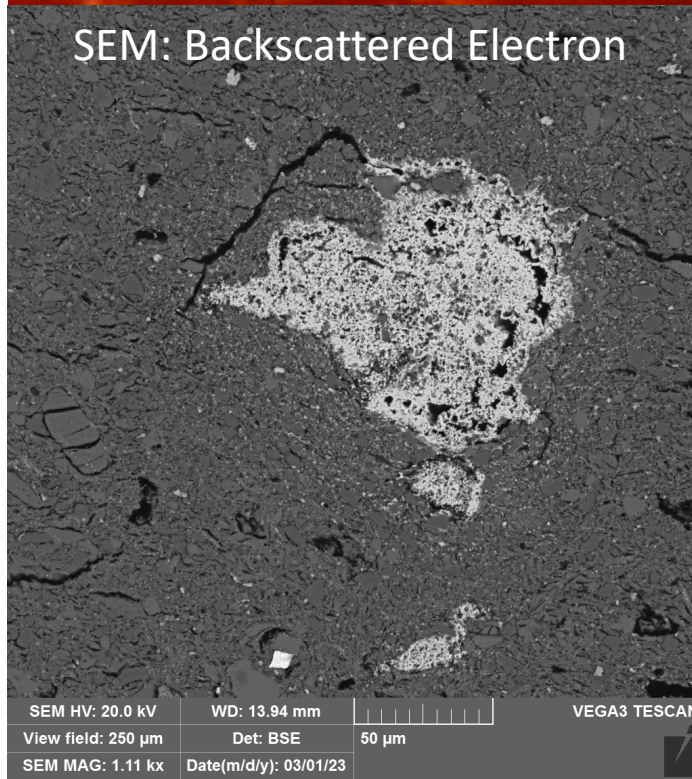
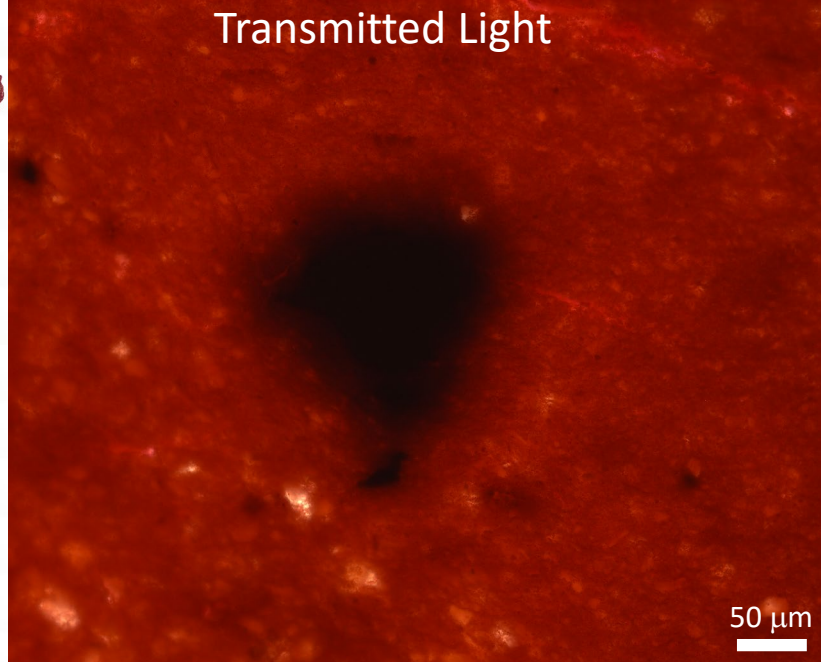
Det: BSE

100 μ m

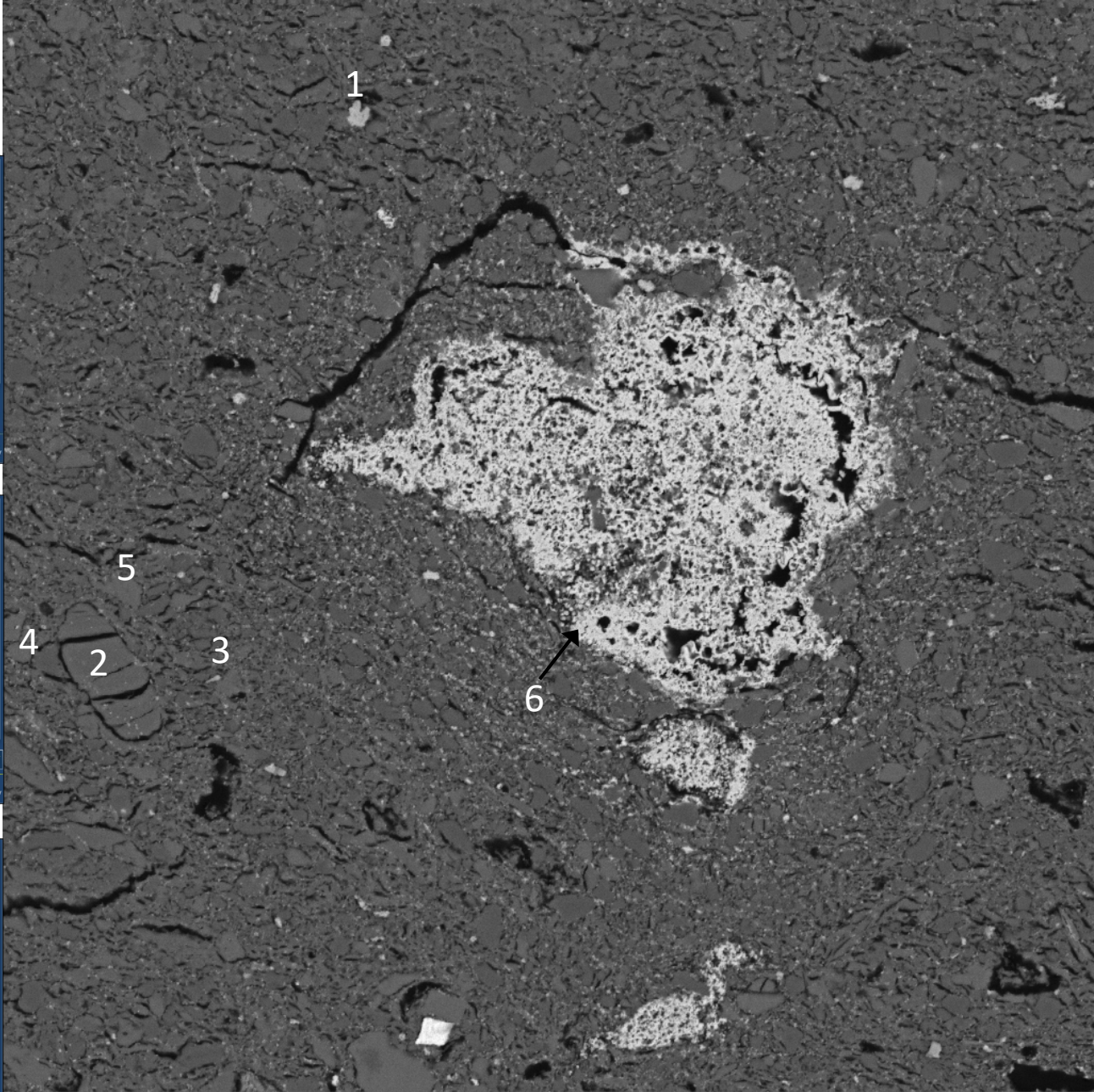
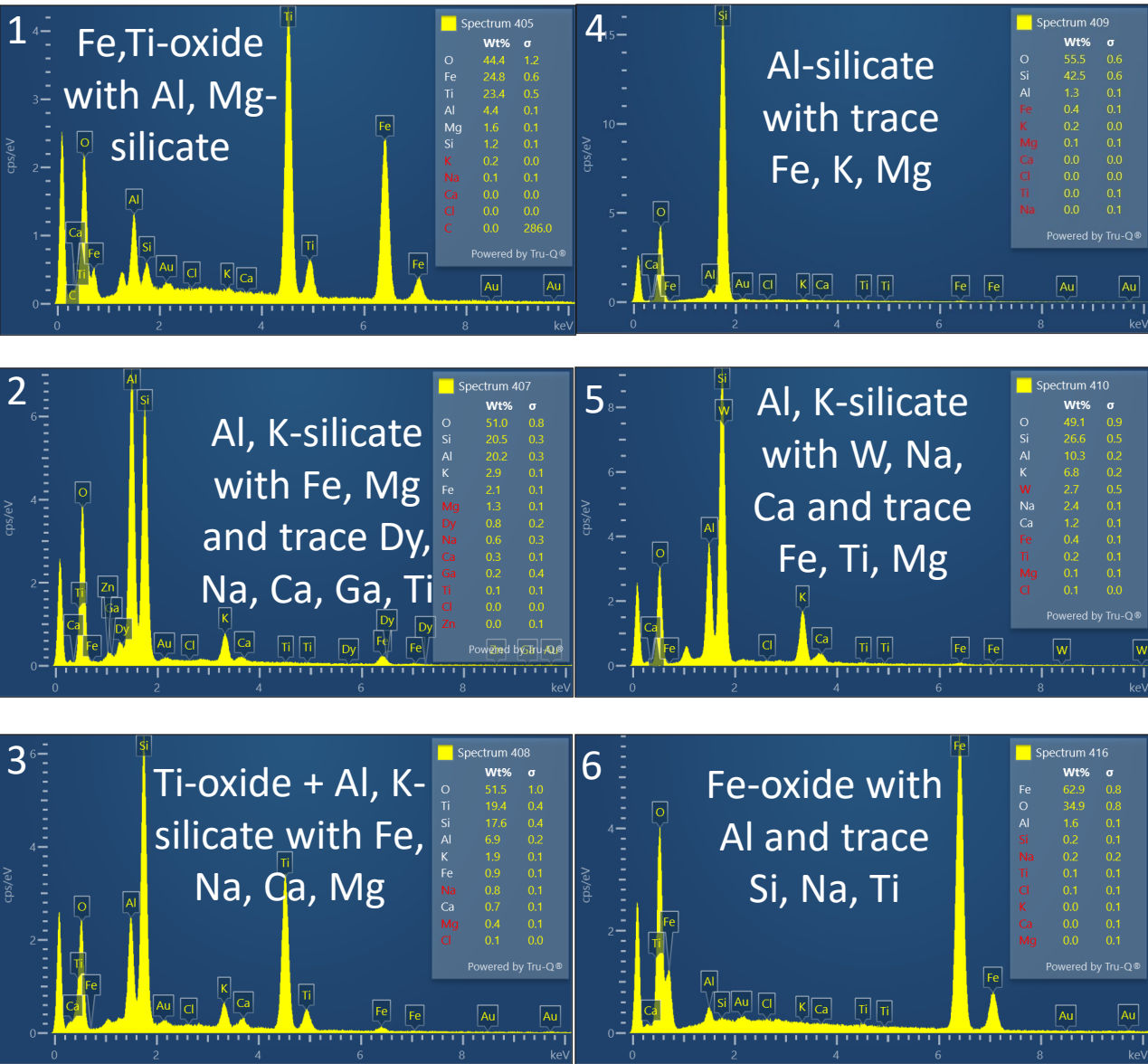
SEM MAG: 695 x

Date(m/d/y): 03/01/23

SEM: Backscattered Electron



EDS Point Analyses on Distinct Phases in Matrix around High-Z Mineral (opaque in TL, high reflectance in RL)



SEM HV: 20.0 kV

WD: 13.94 mm

View field: 250 μm

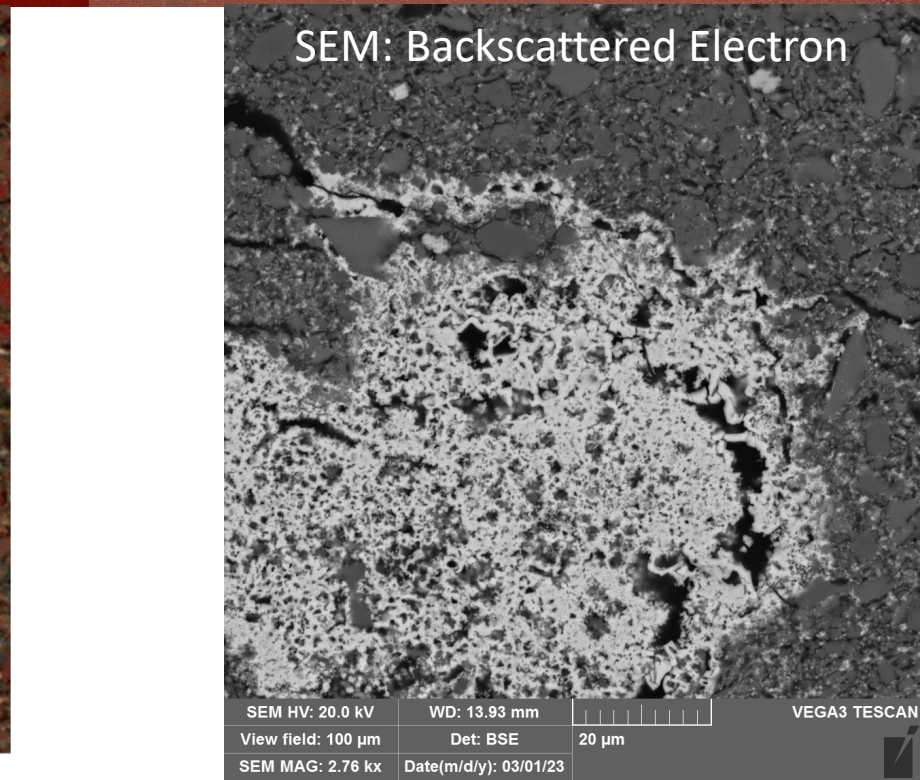
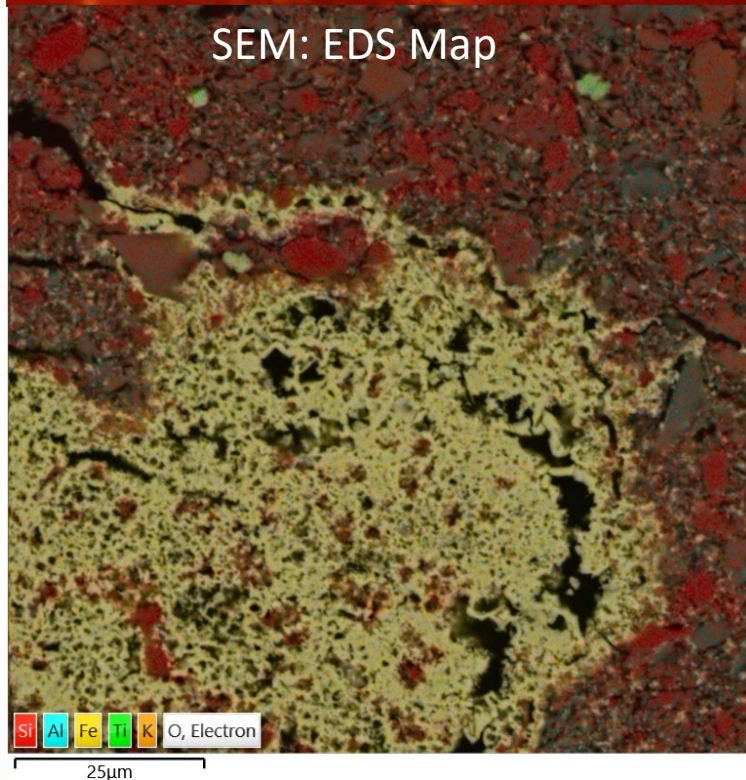
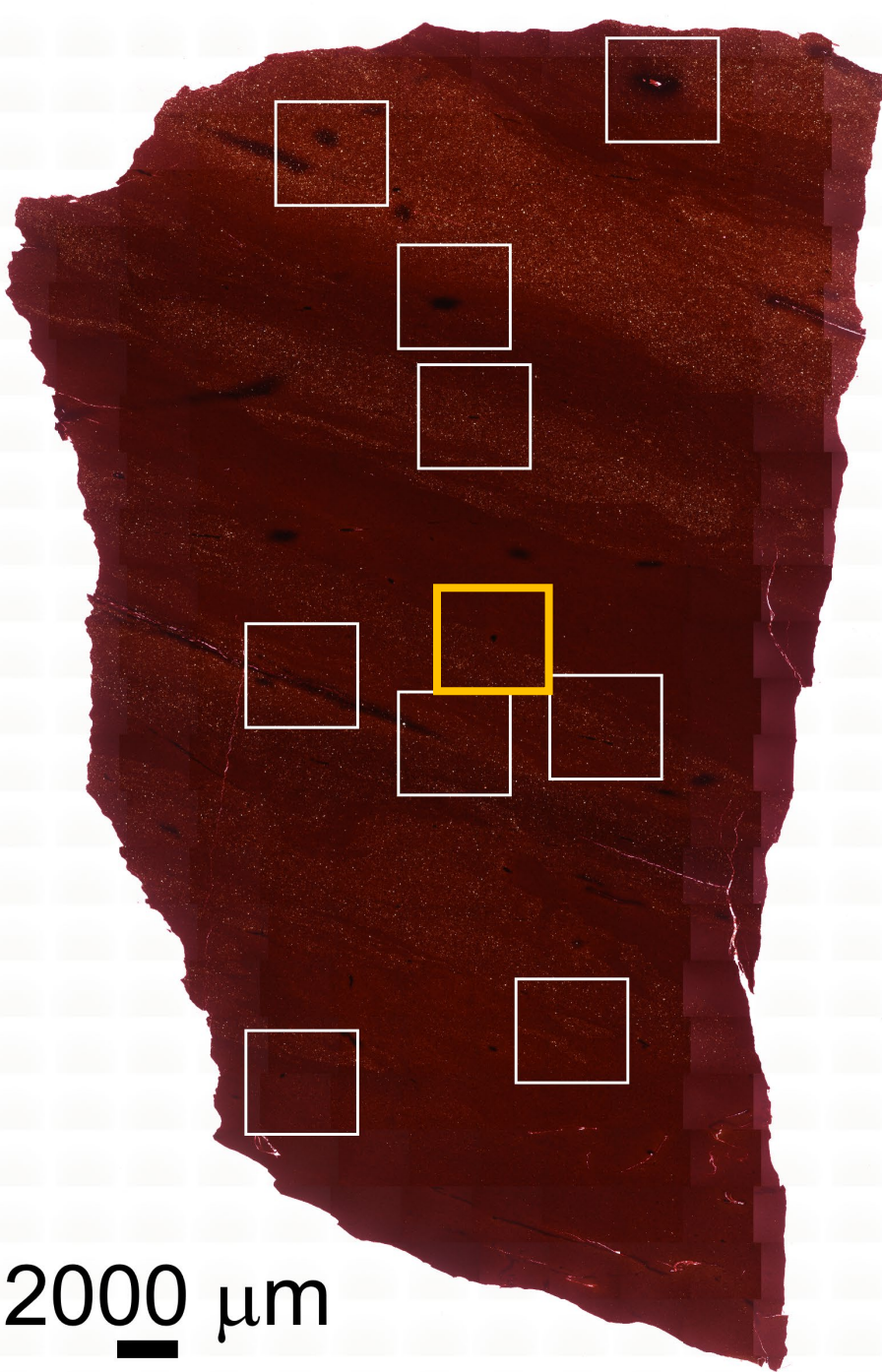
Det: BSE

SEM MAG: 1.11 kx

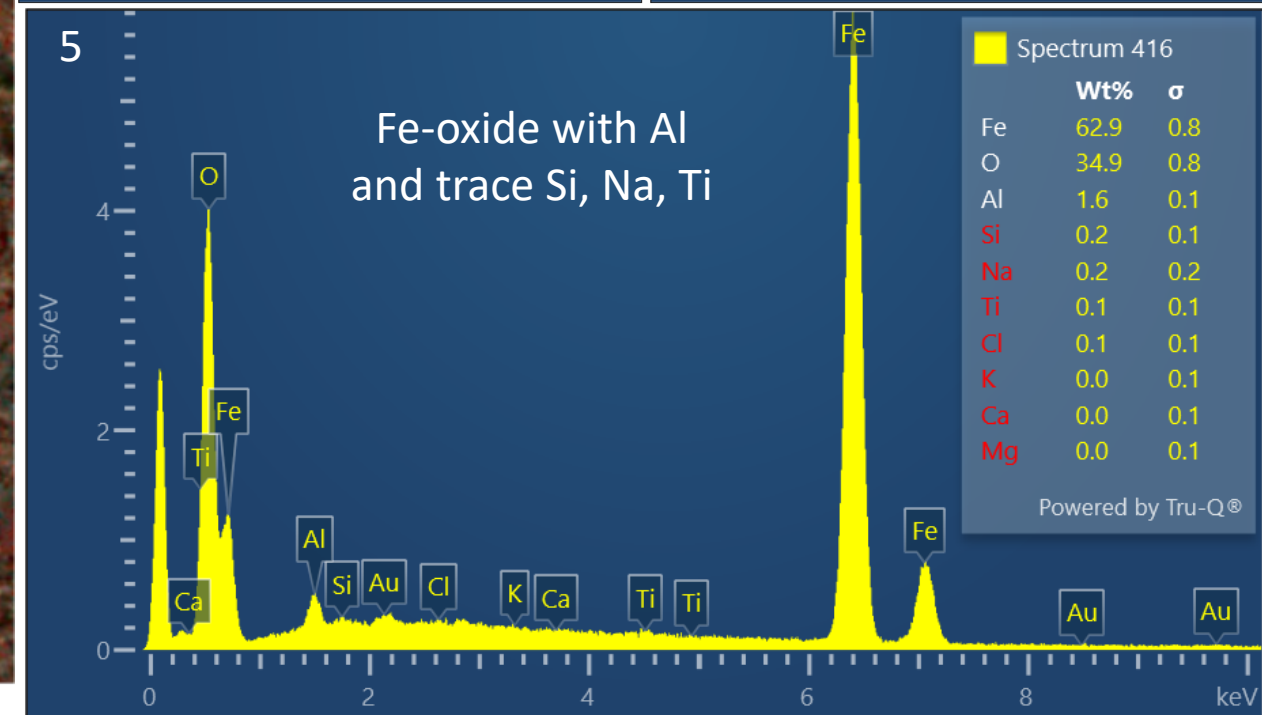
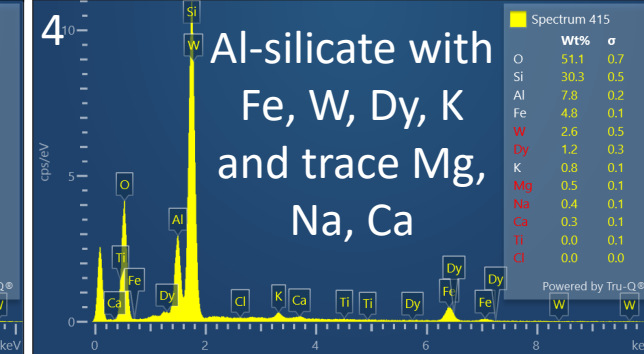
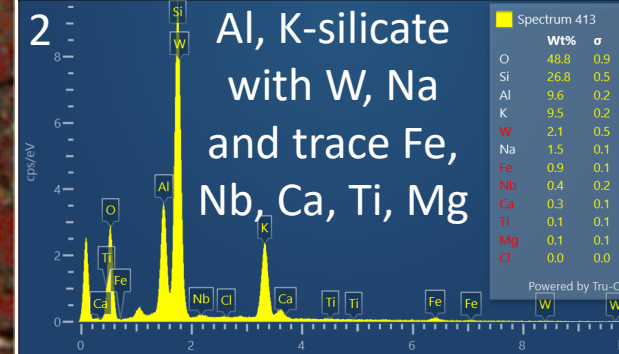
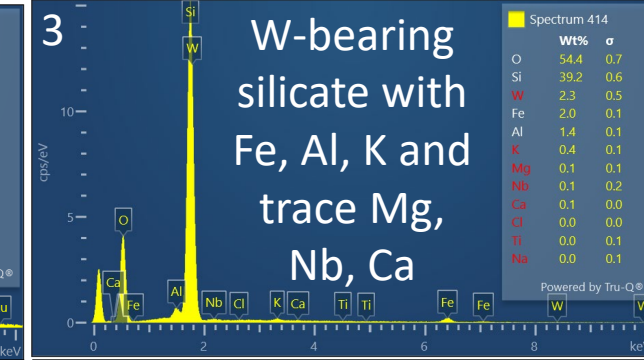
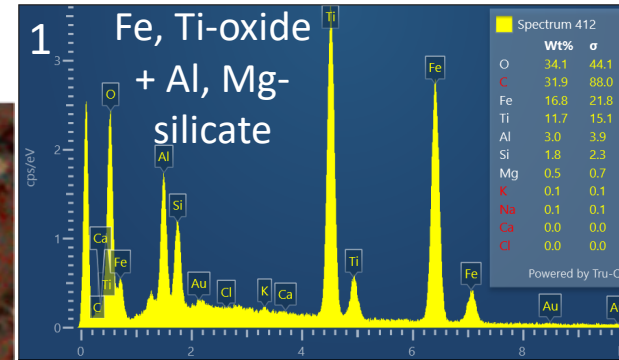
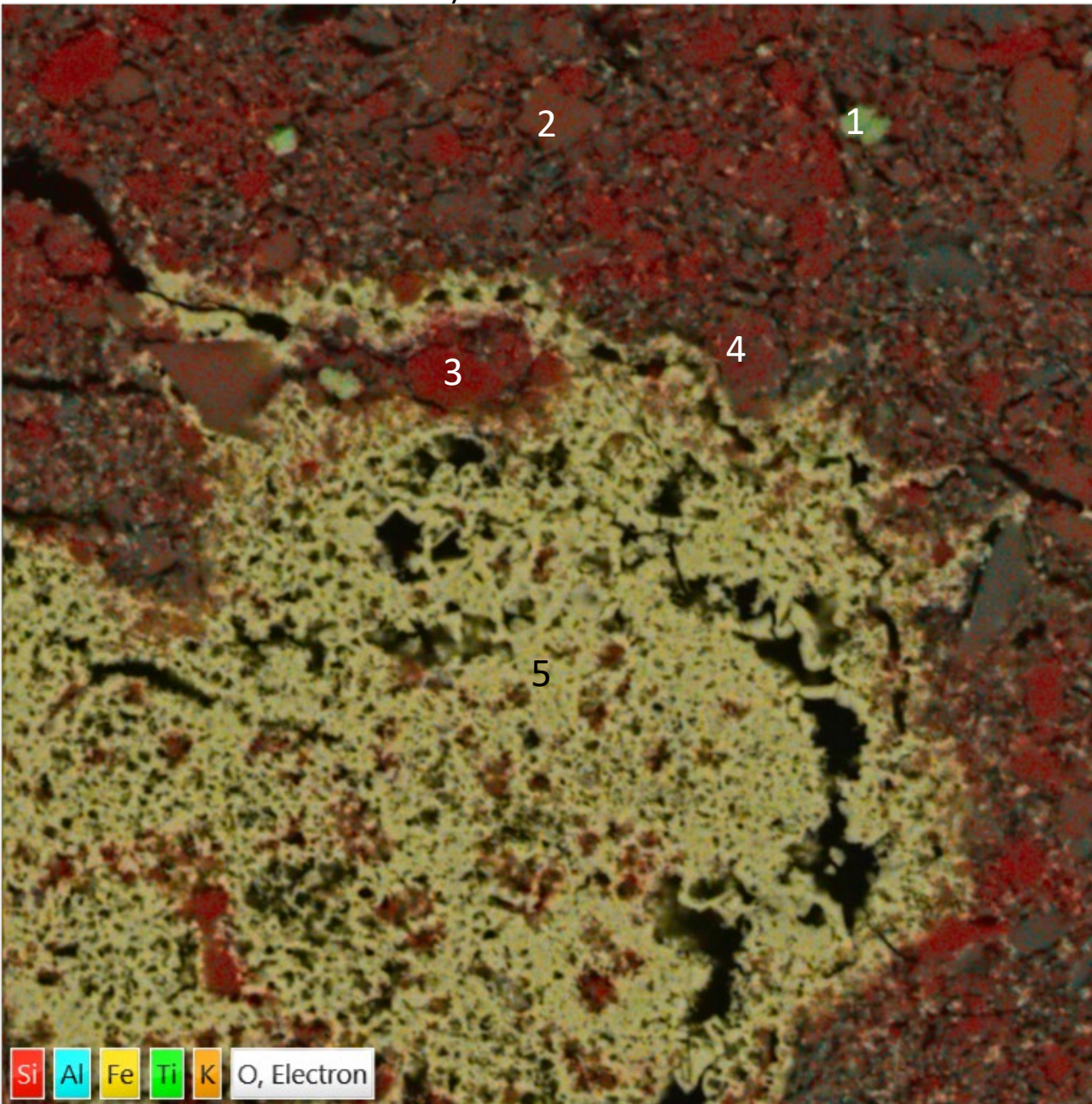
Date(m/d/y): 03/01/23

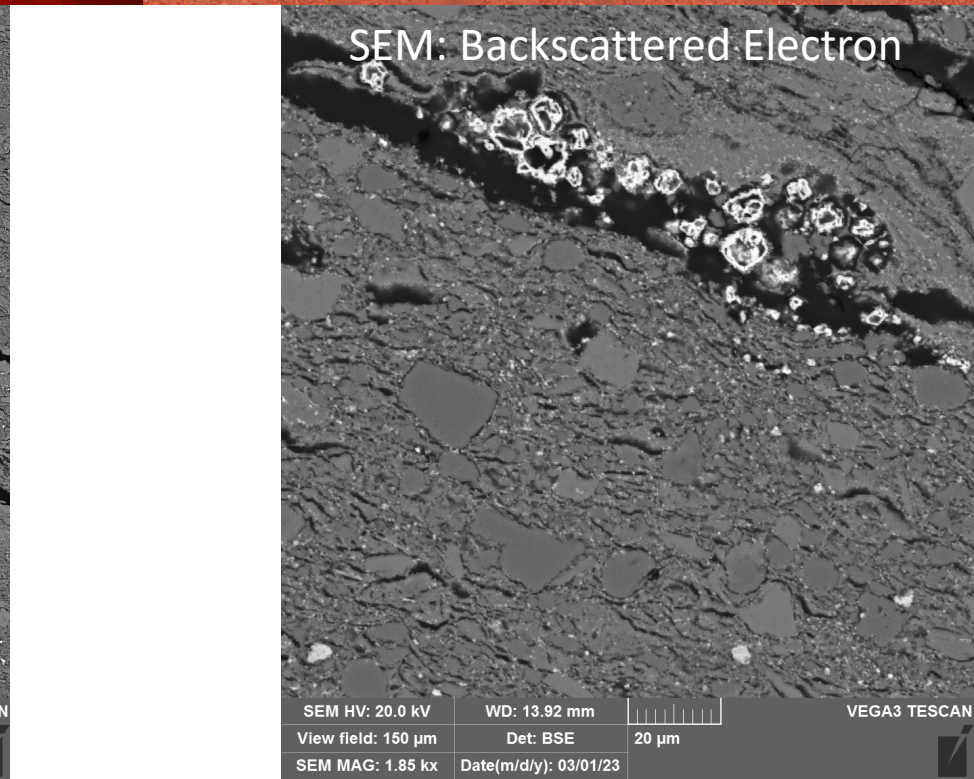
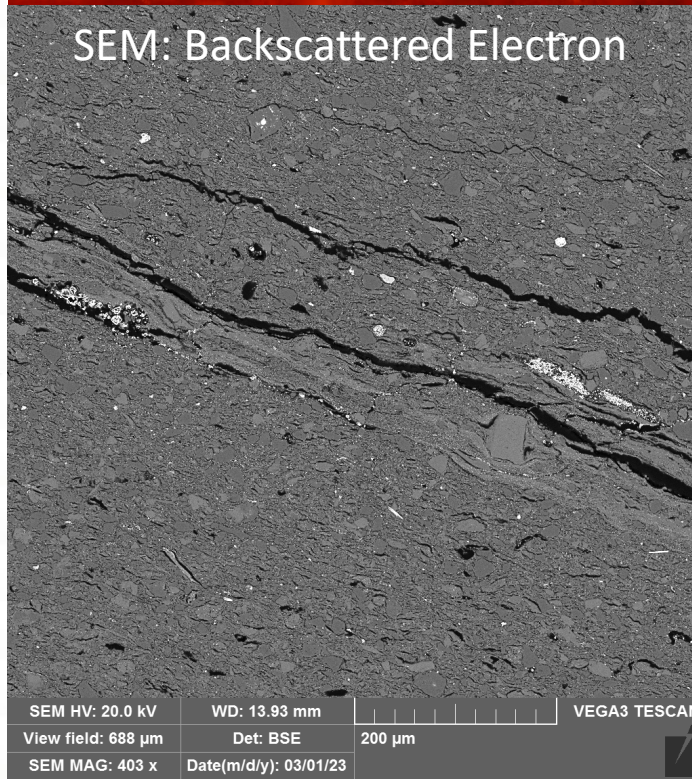
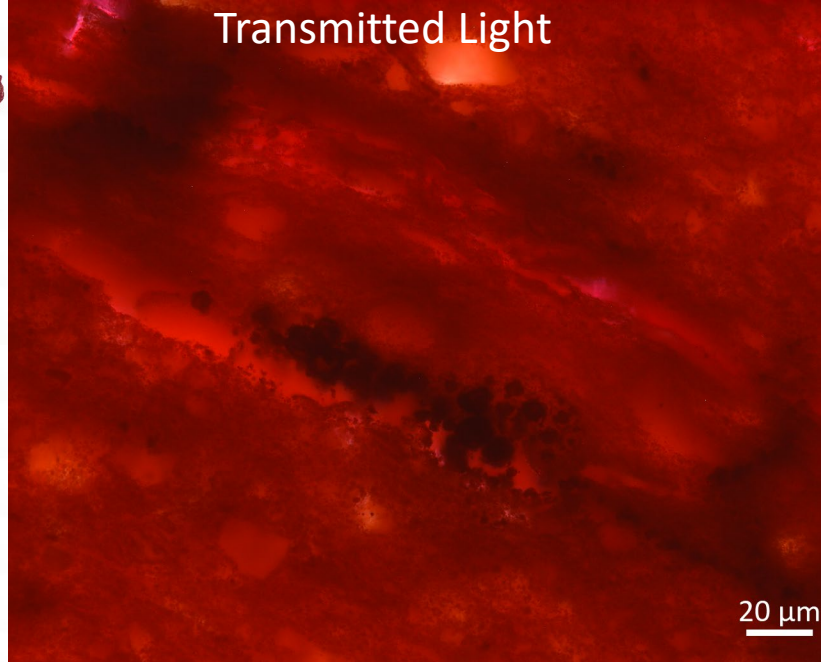
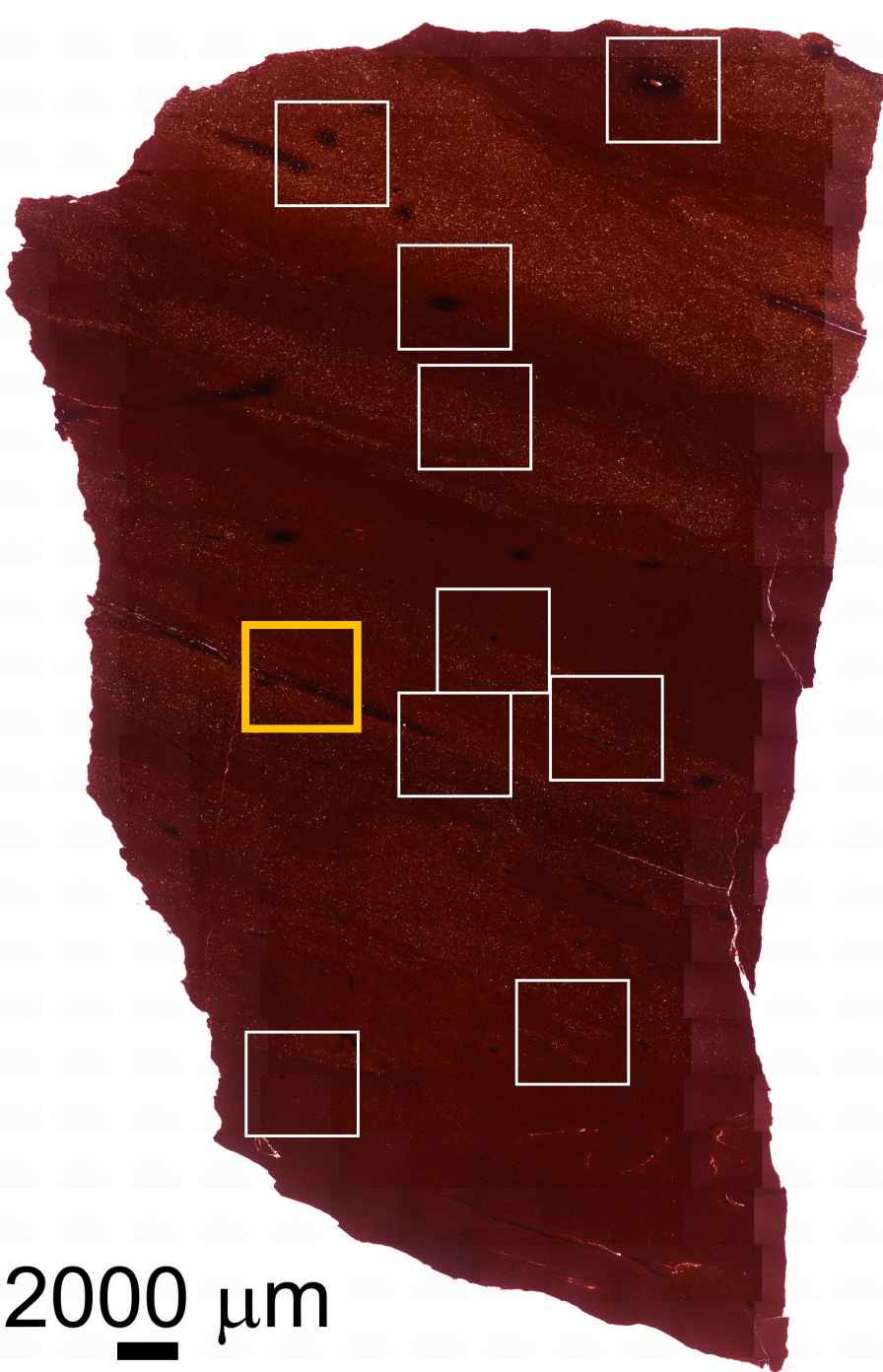
50 μm

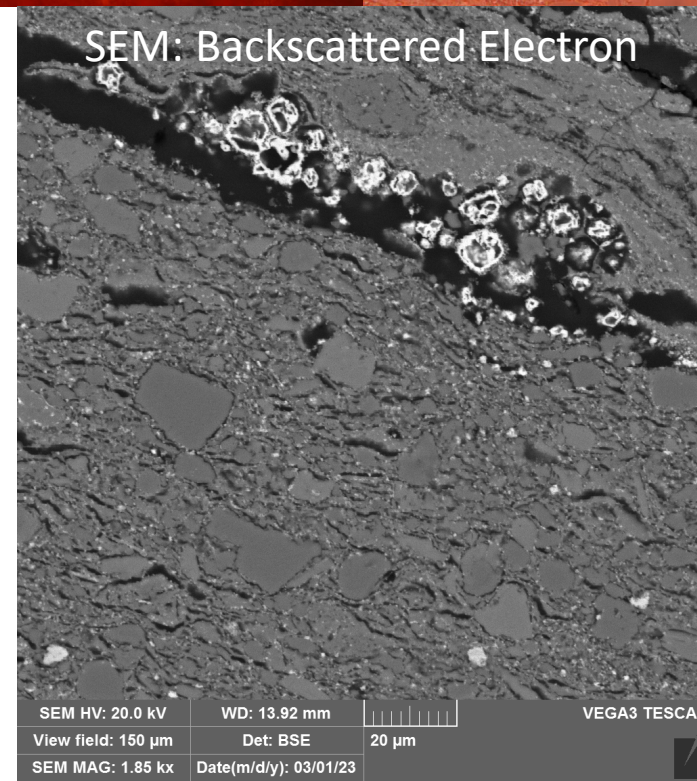
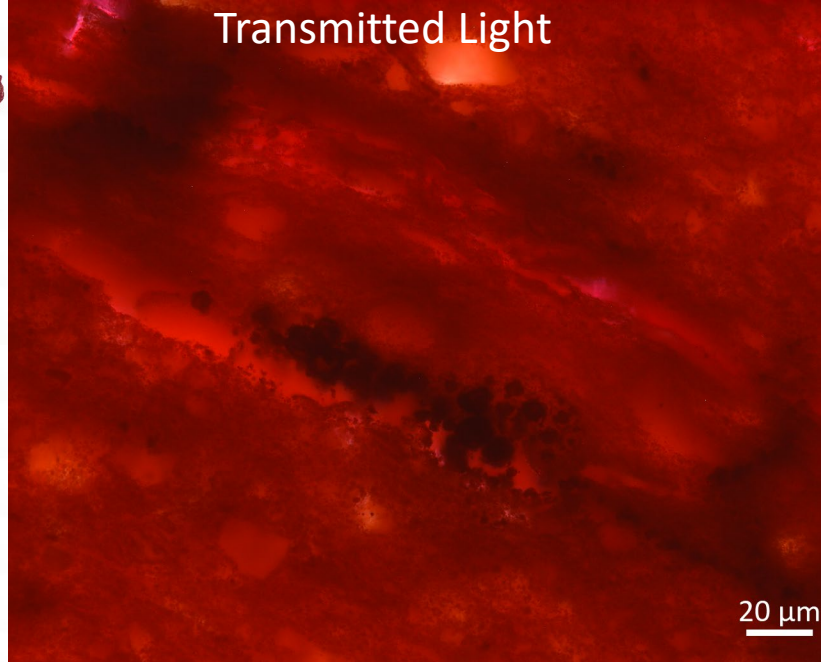
VEGA3 TESCAN



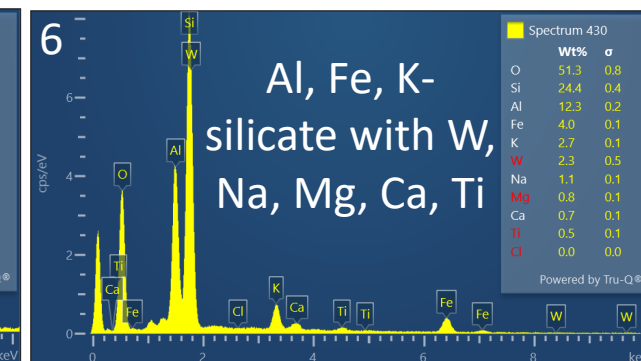
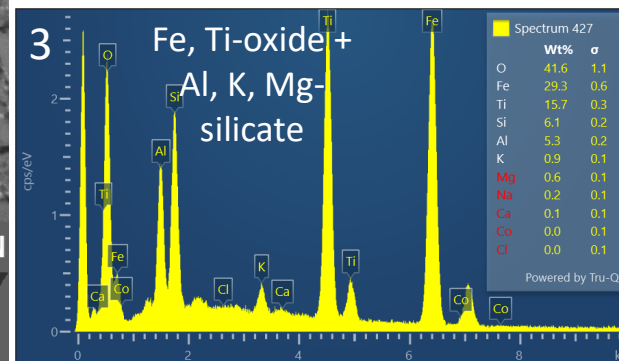
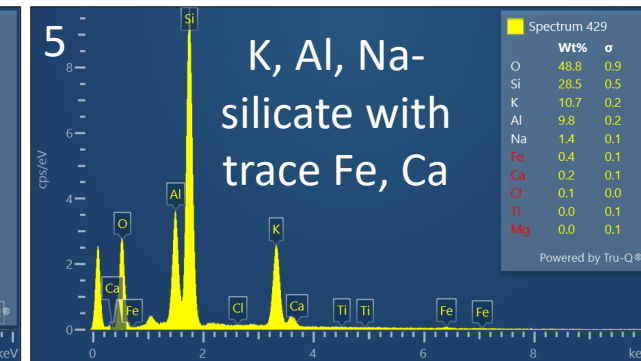
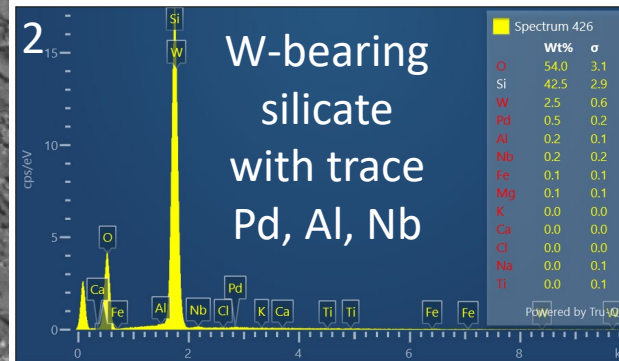
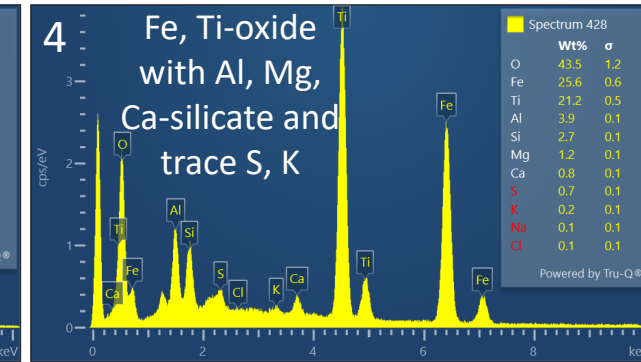
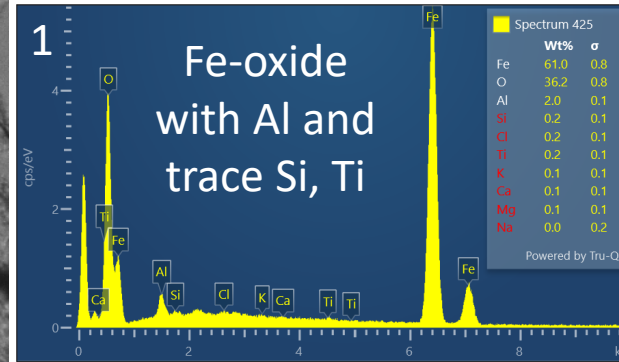
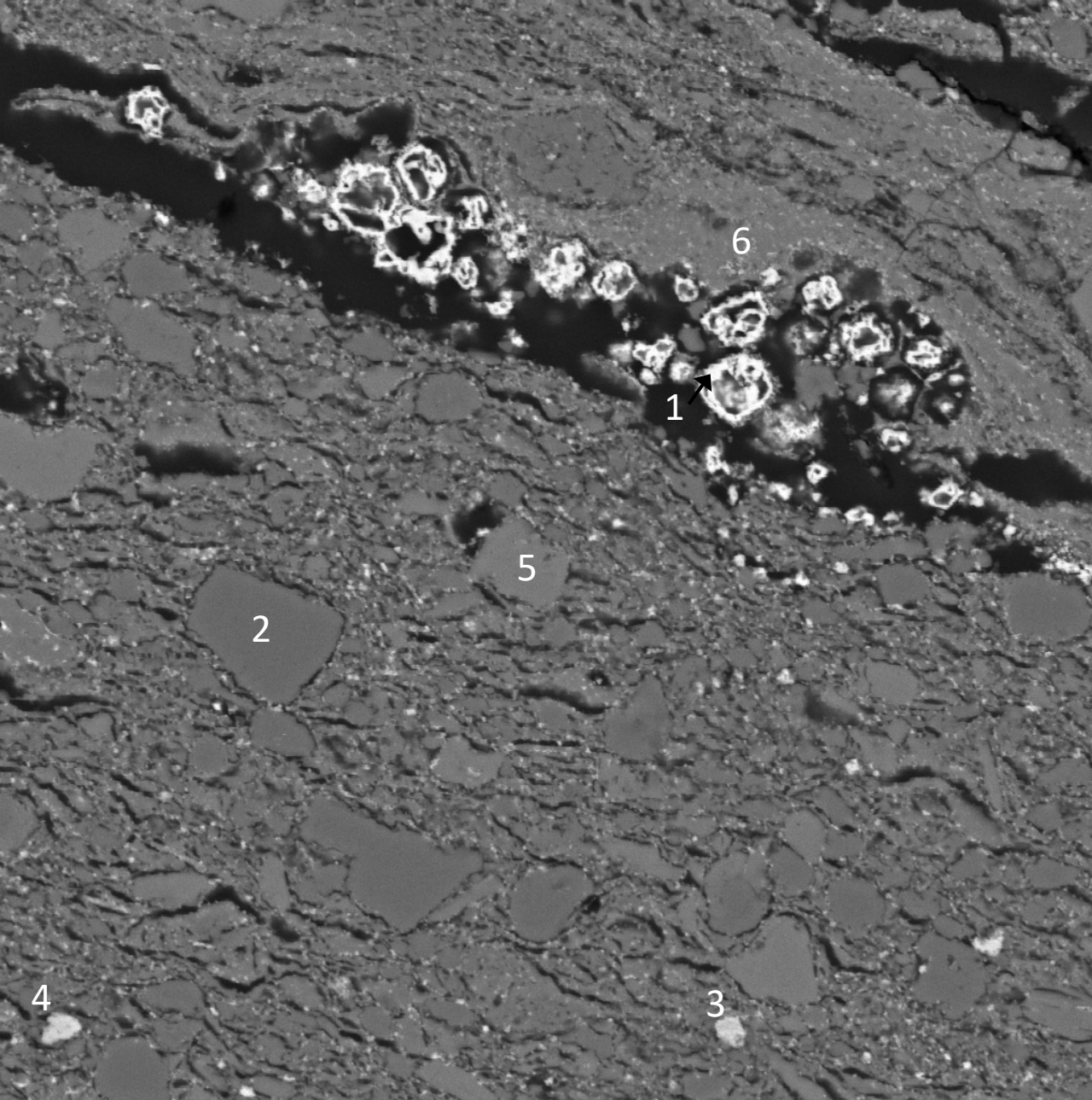
EDS Map and Point Analyses of High-Z Mineral (opaque in TL, high reflectance in RL) and Distinct Phases in Matrix

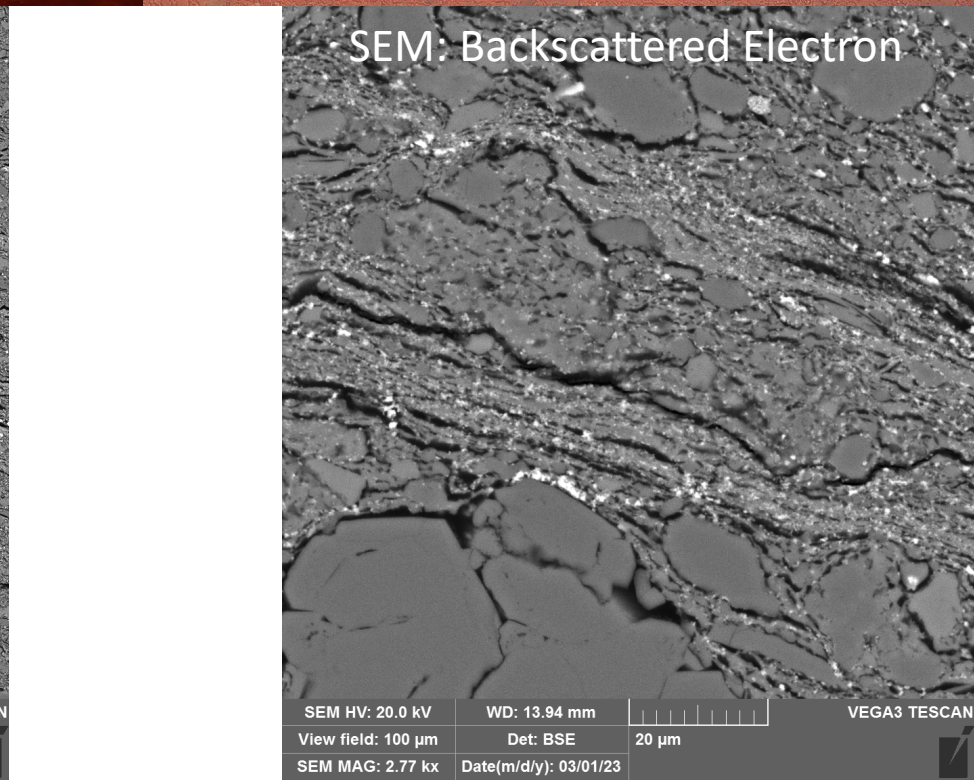
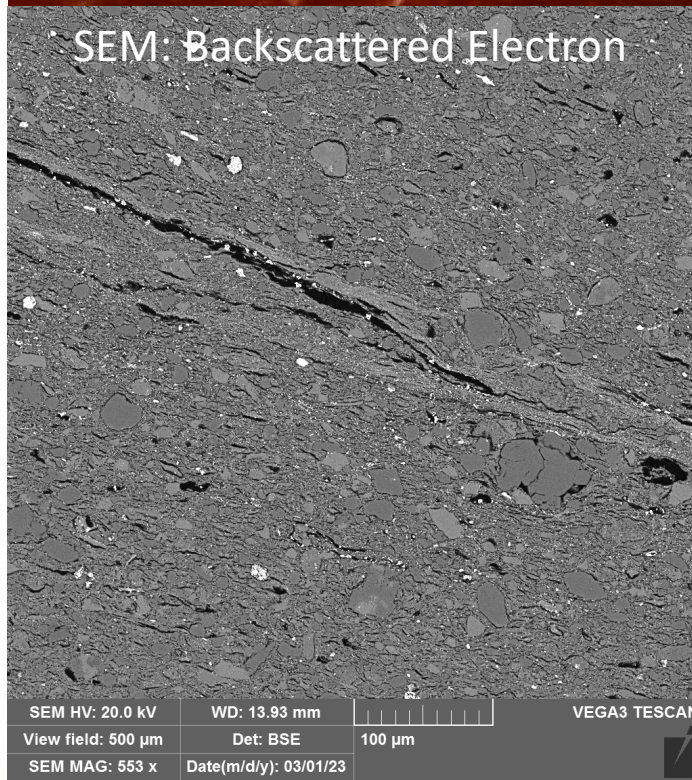
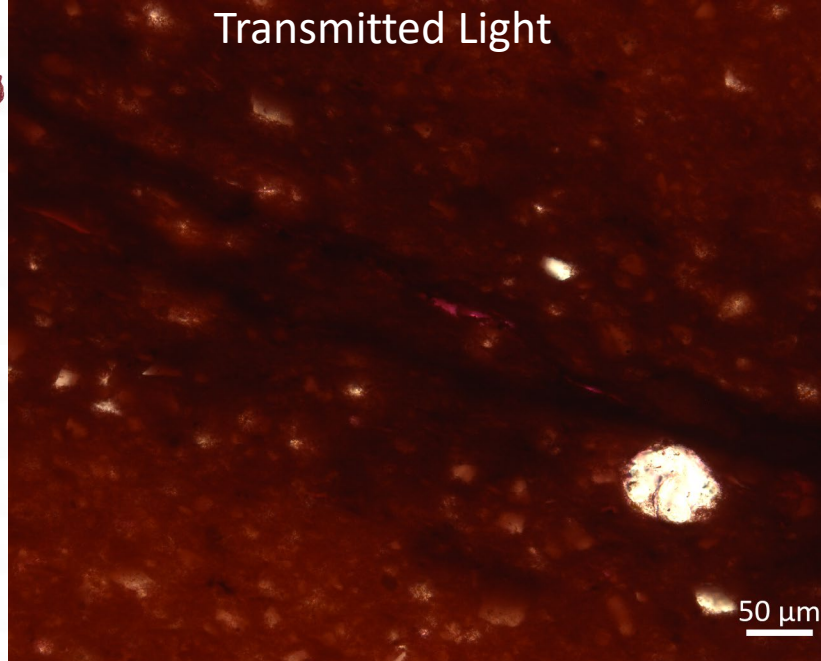


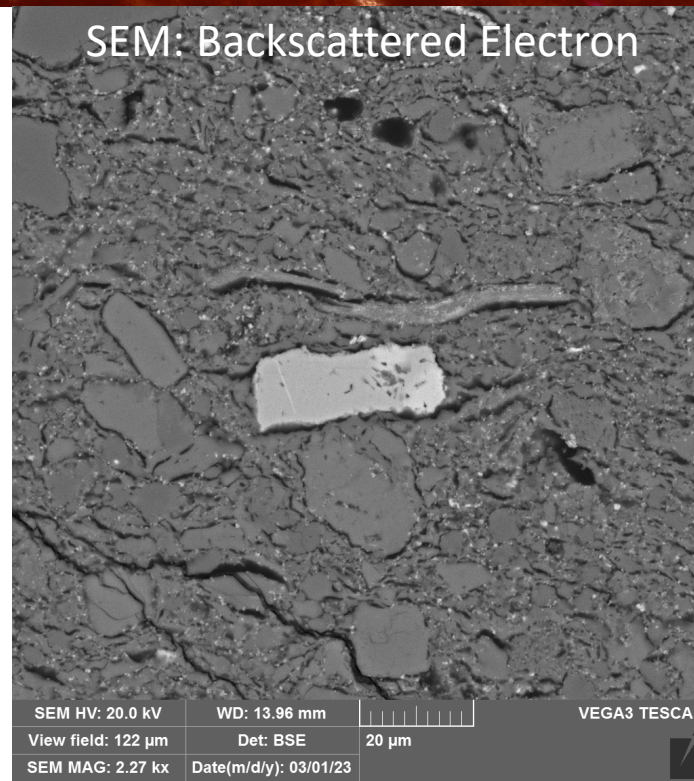
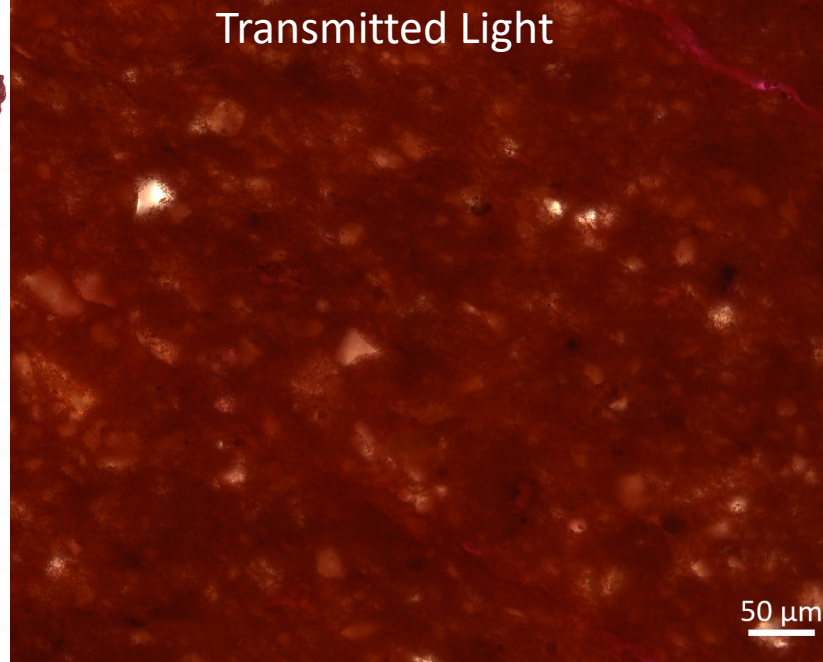
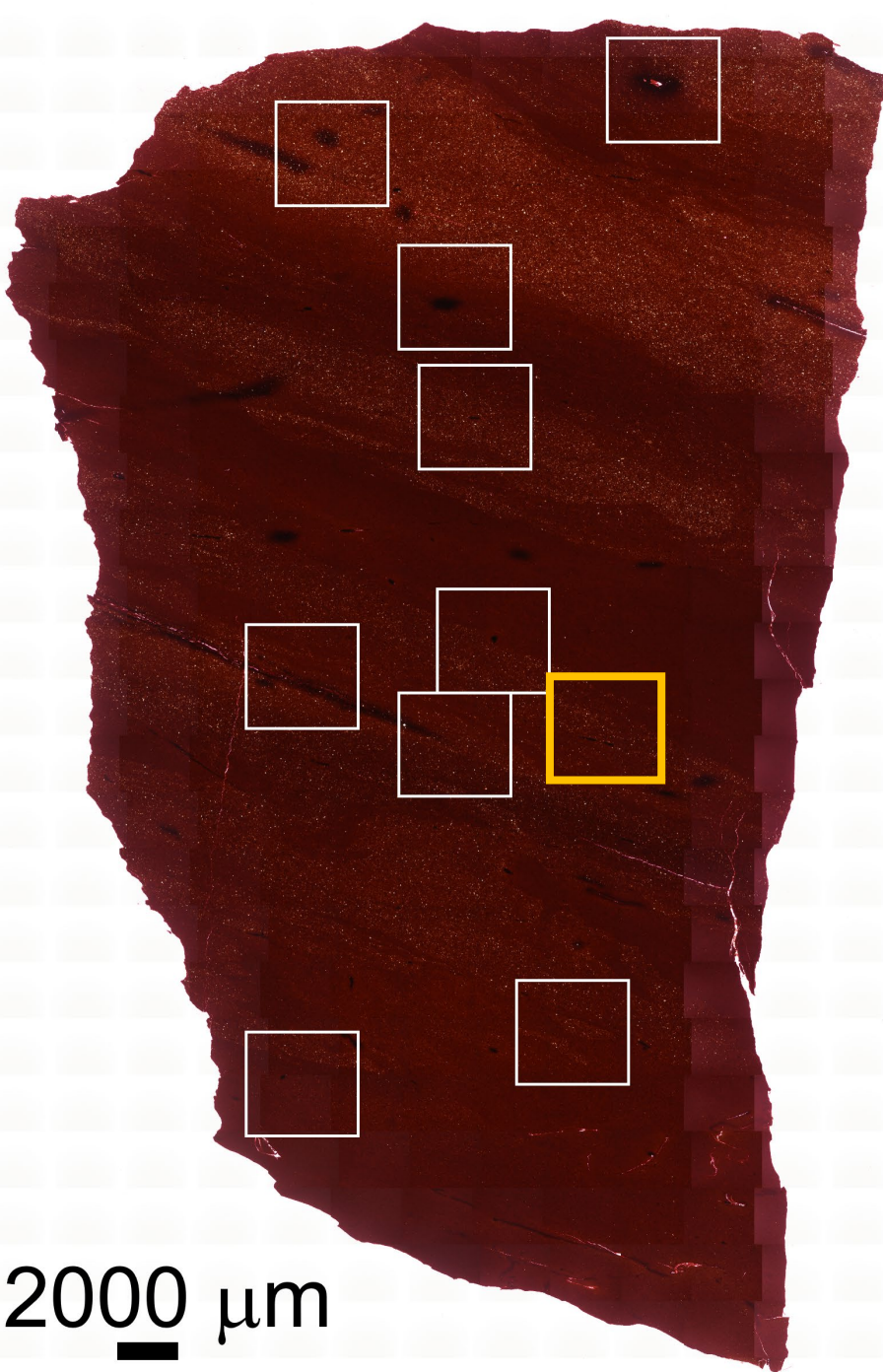




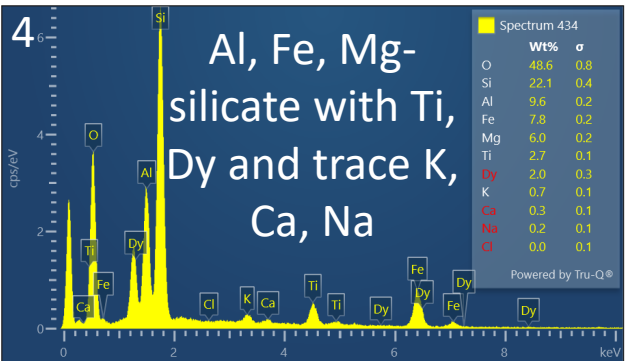
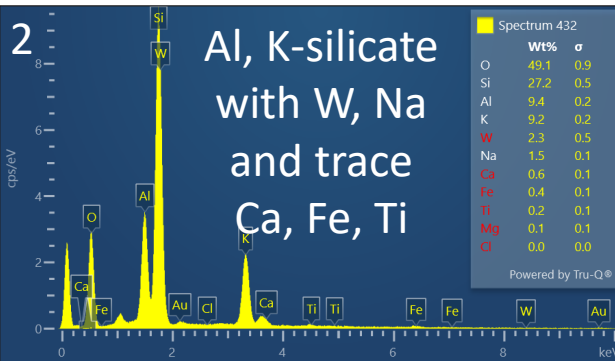
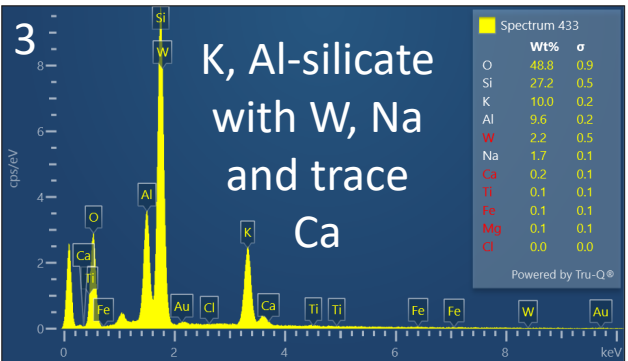
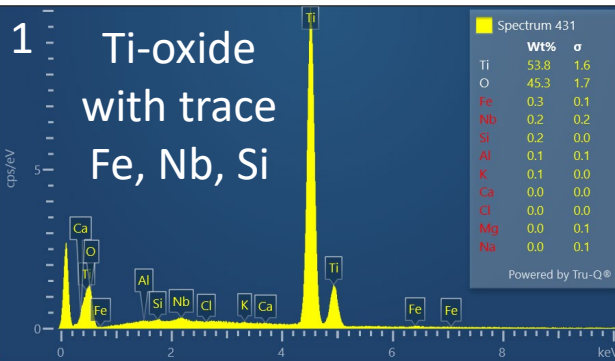
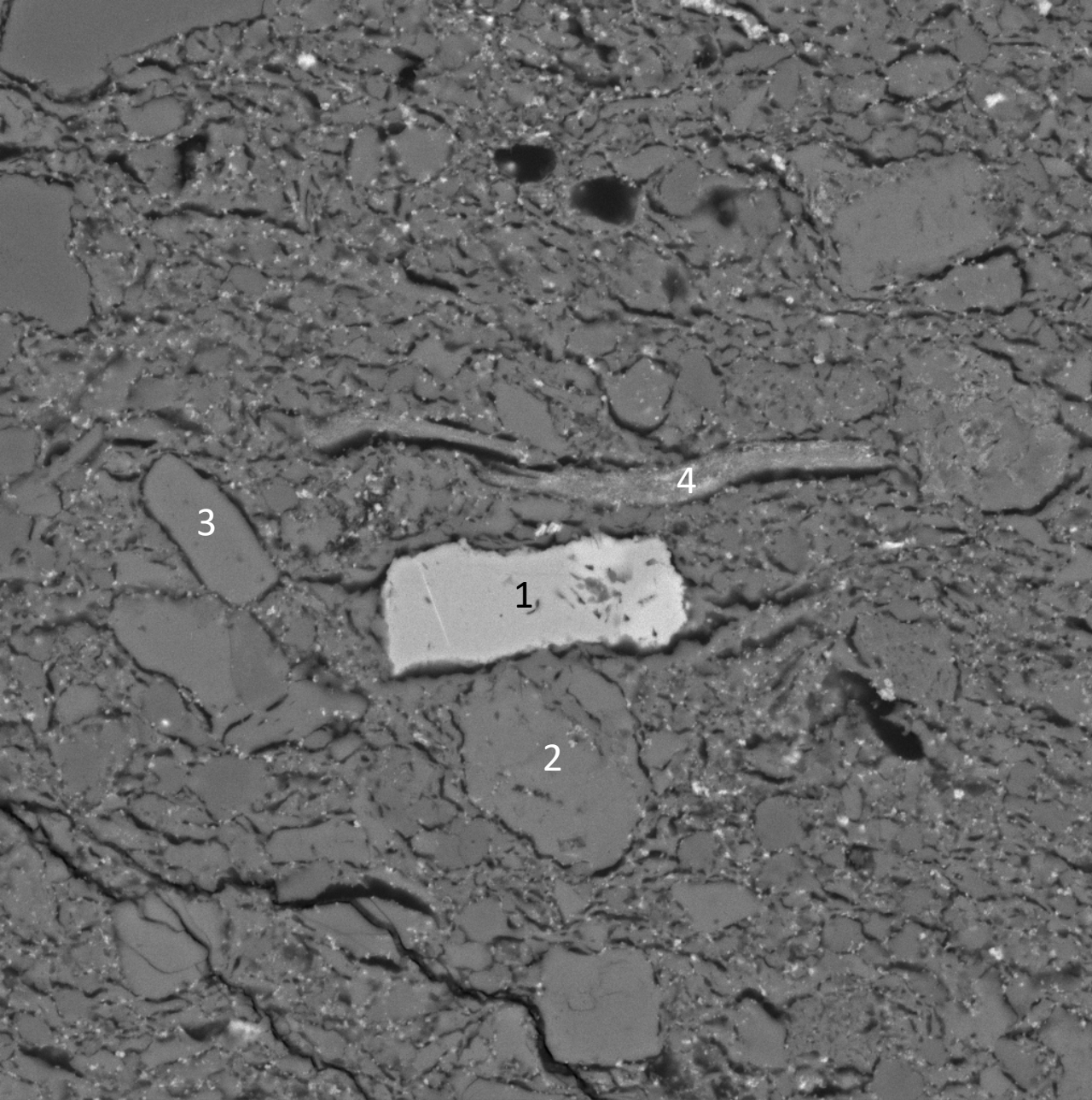
EDS Point Analyses on Distinct Phases in Matrix and Fracture Fill, including High-Z Mineral (opaque in TL, high reflectance in RL) and Fine-grained Material

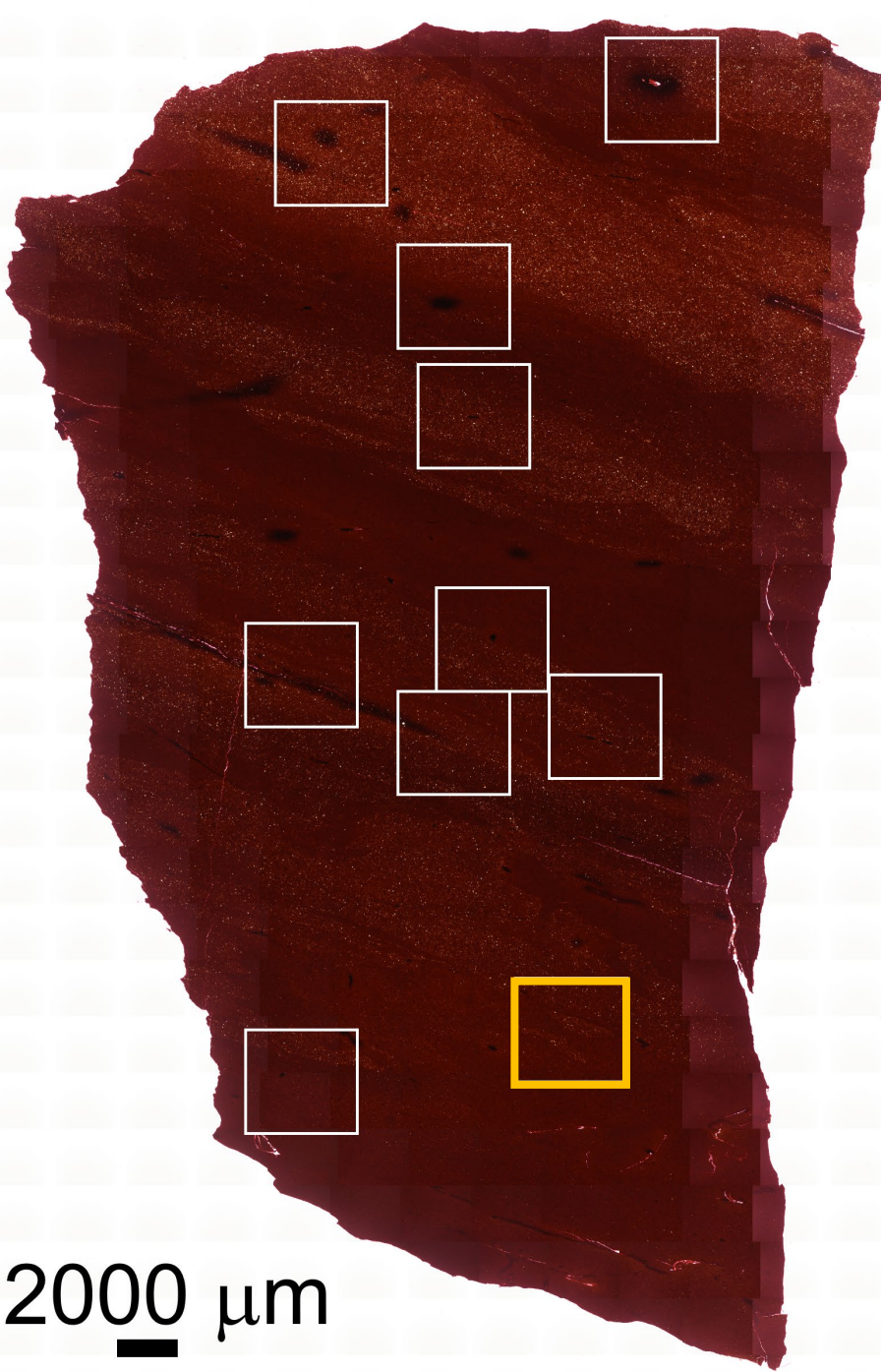




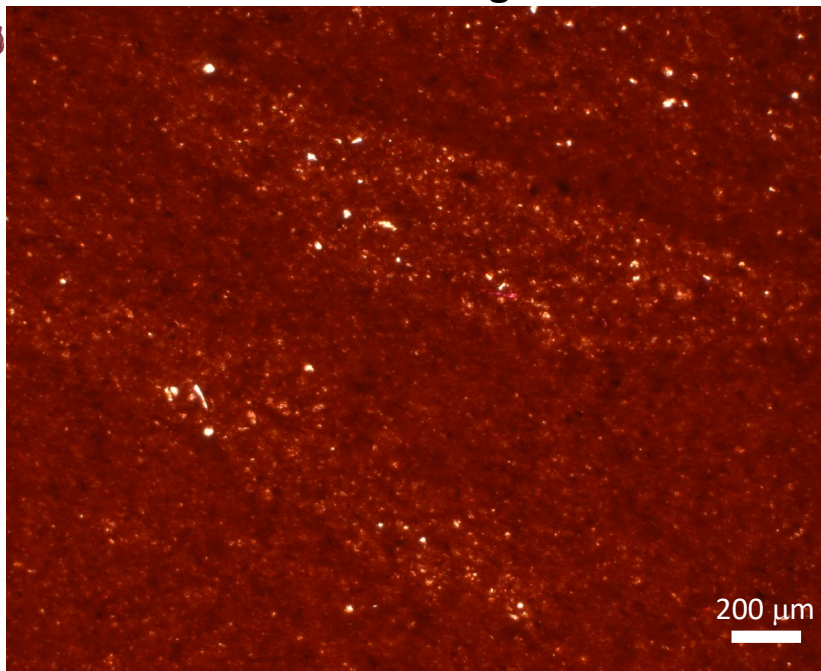


EDS Point Analyses on Distinct Phases in Matrix

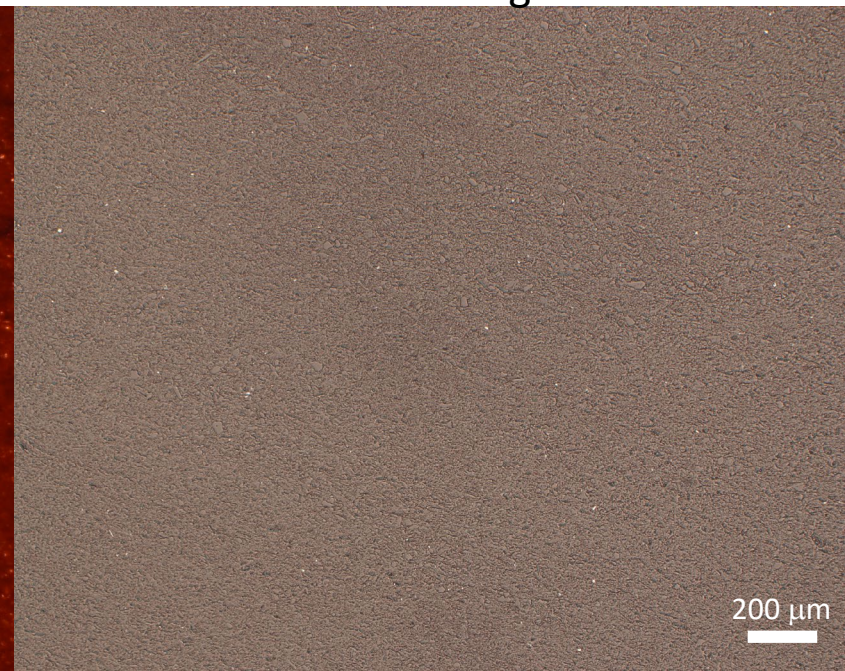




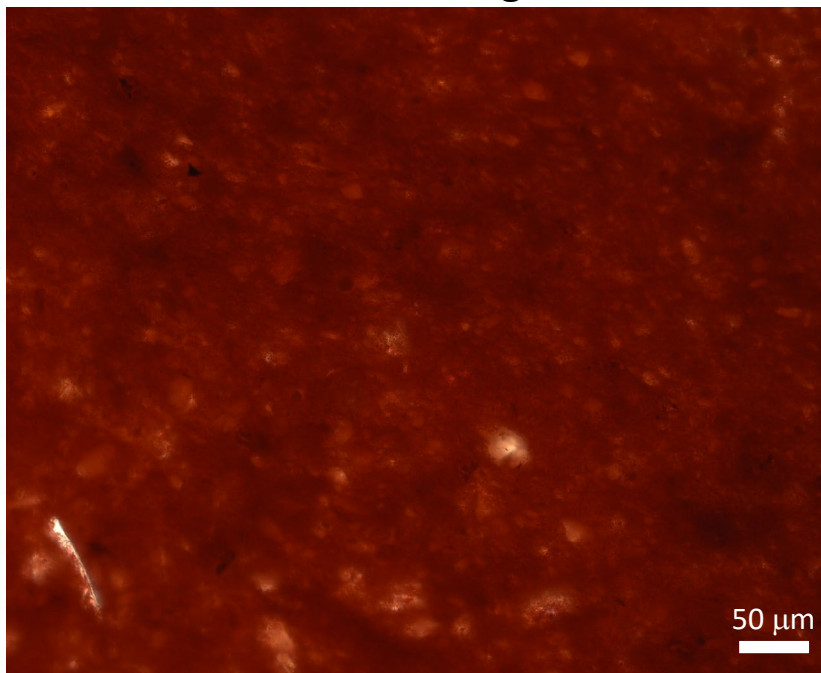
Transmitted Light



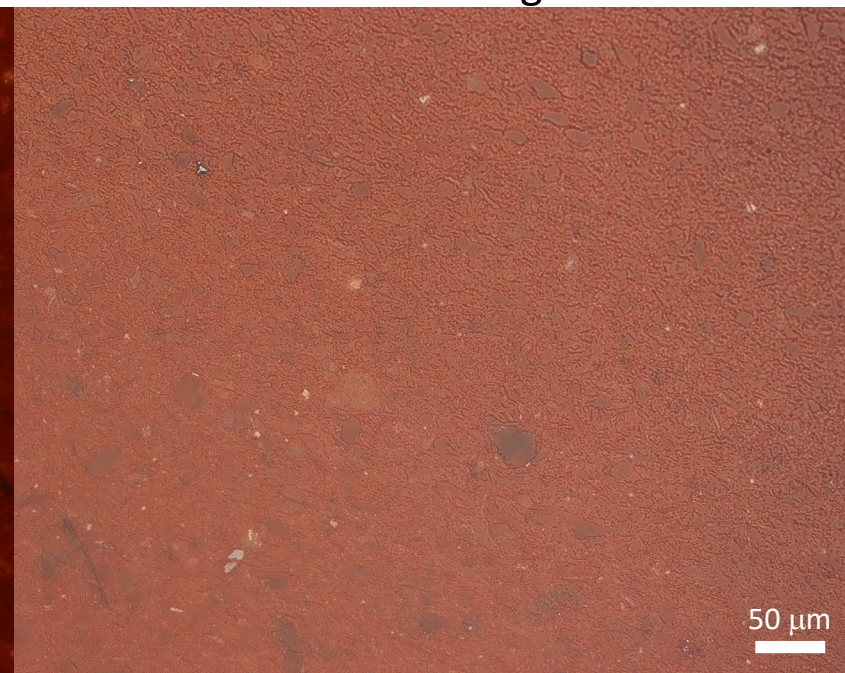
Reflected Light



Transmitted Light

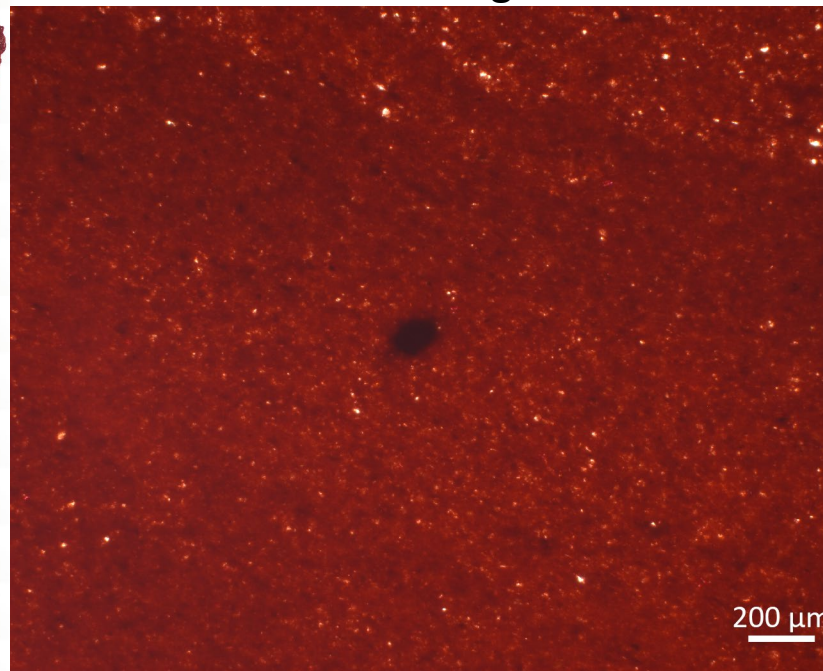


Reflected Light





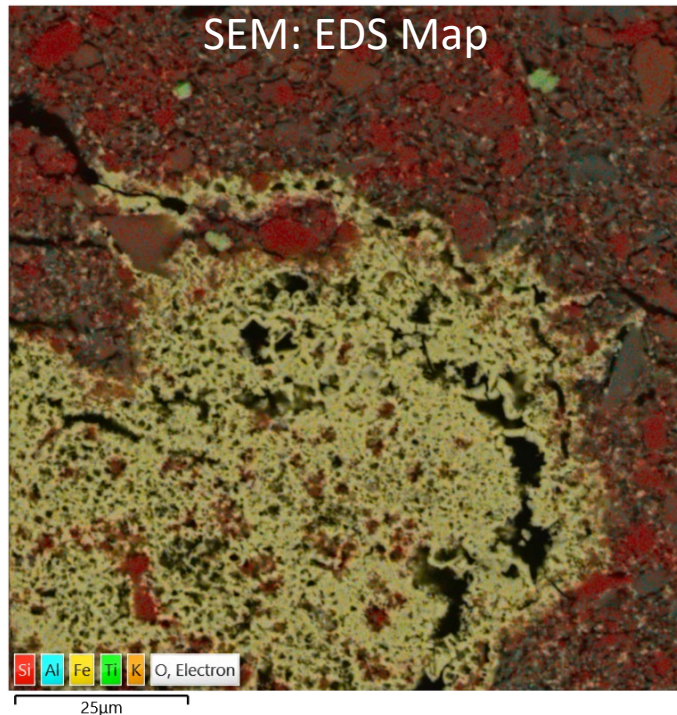
Transmitted Light



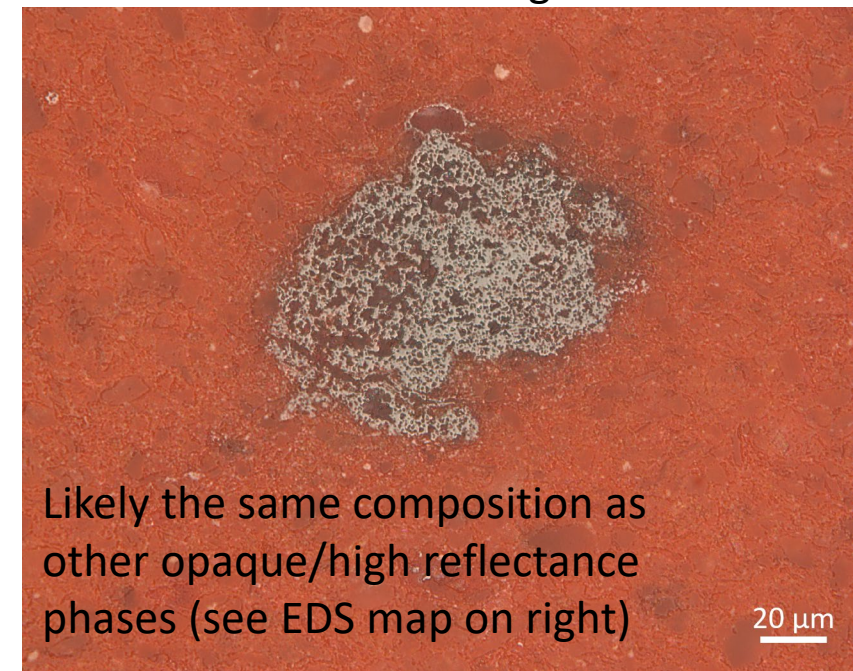
Reflected Light



SEM: EDS Map



Reflected Light



Likely the same composition as other opaque/high reflectance phases (see EDS map on right)