

# Stardust foil C2086W1

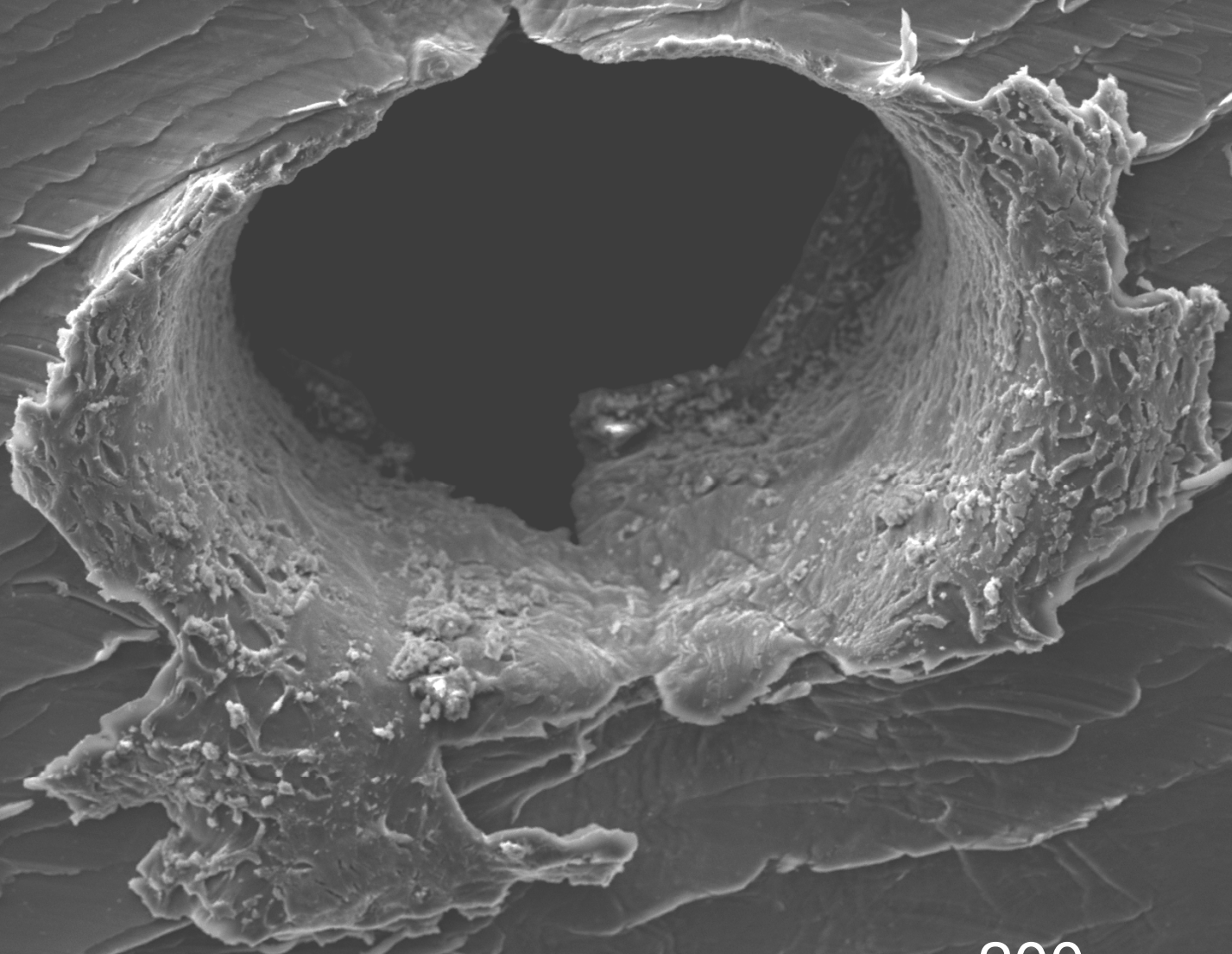
Large crater, deformed by detachment from frame.  
Original top lip diameter c. 240 microns? Impactor of  
c. 43 microns diameter and c.130 ng mass?  
Dominated by Mg Fe silicate, olivine  $\text{Fo}_{65}\text{Fa}_{35}$ ?  
Na and Ca-rich silicate with P, S, K and Ti, possibly  
glass? Minor Fe sulfide.  
Secondary electron and backscattered electron  
imagery. Energy dispersive X-ray spectra and  
element maps

Anton Kearsley, NHM

28<sup>th</sup> May 2006

Transferred to Frank Stadermann for NanoSIMS

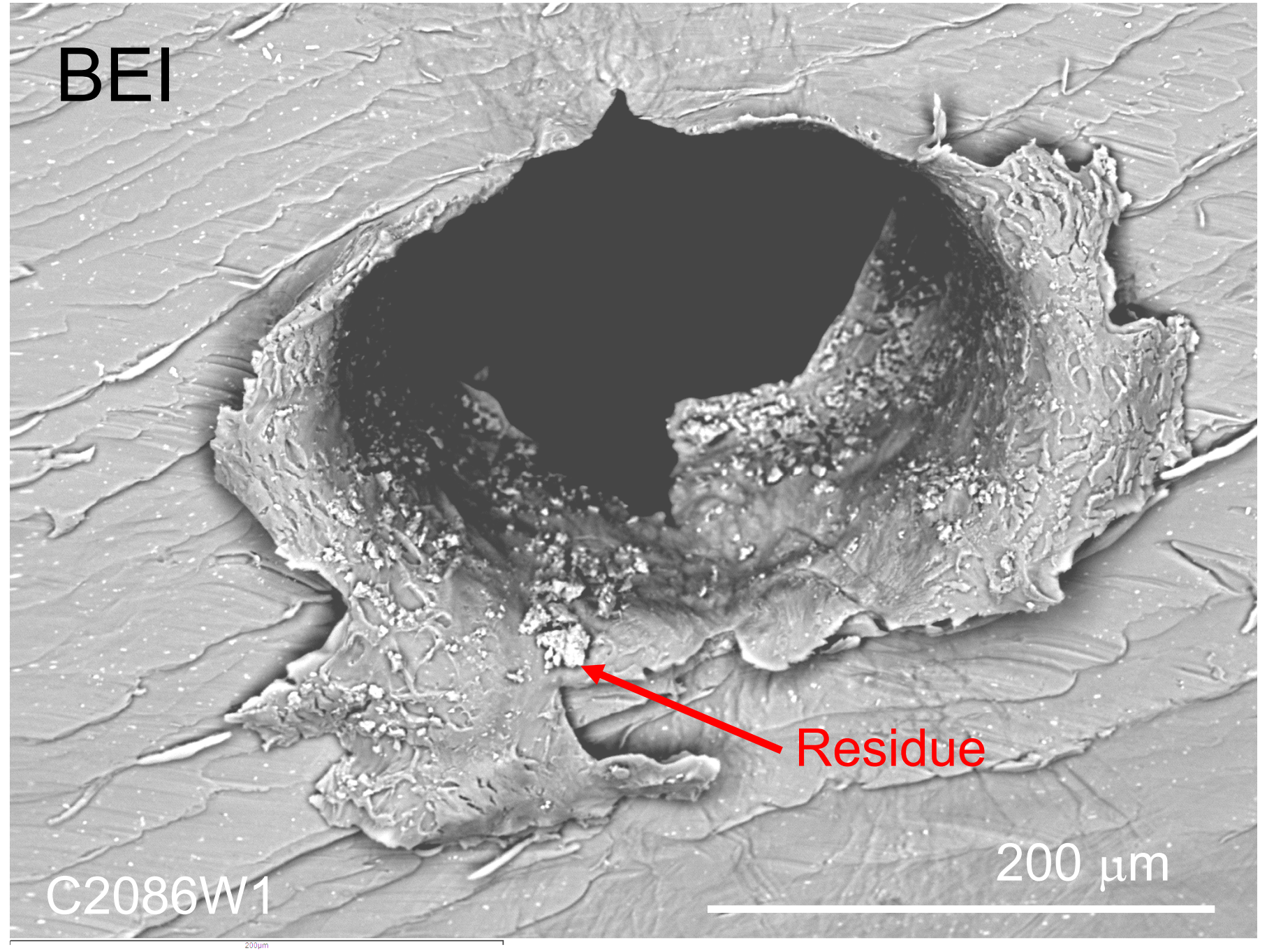
SEI



C2086W1

200  $\mu\text{m}$

BEI



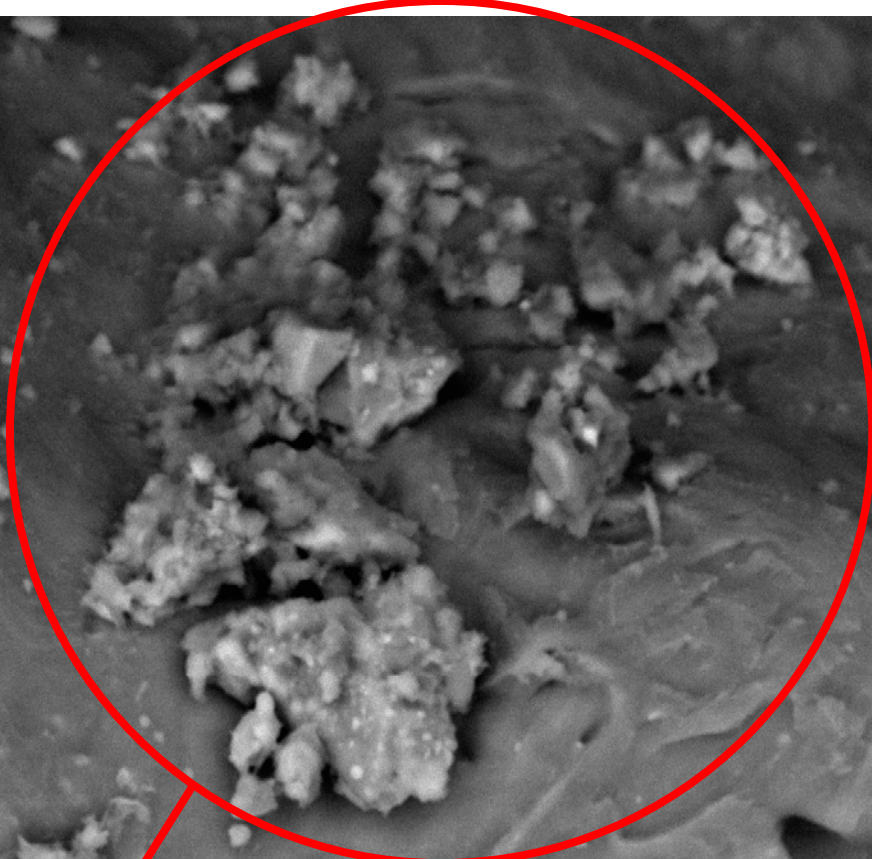
Residue

200  $\mu\text{m}$

C2086W1

200 $\mu\text{m}$

BEI



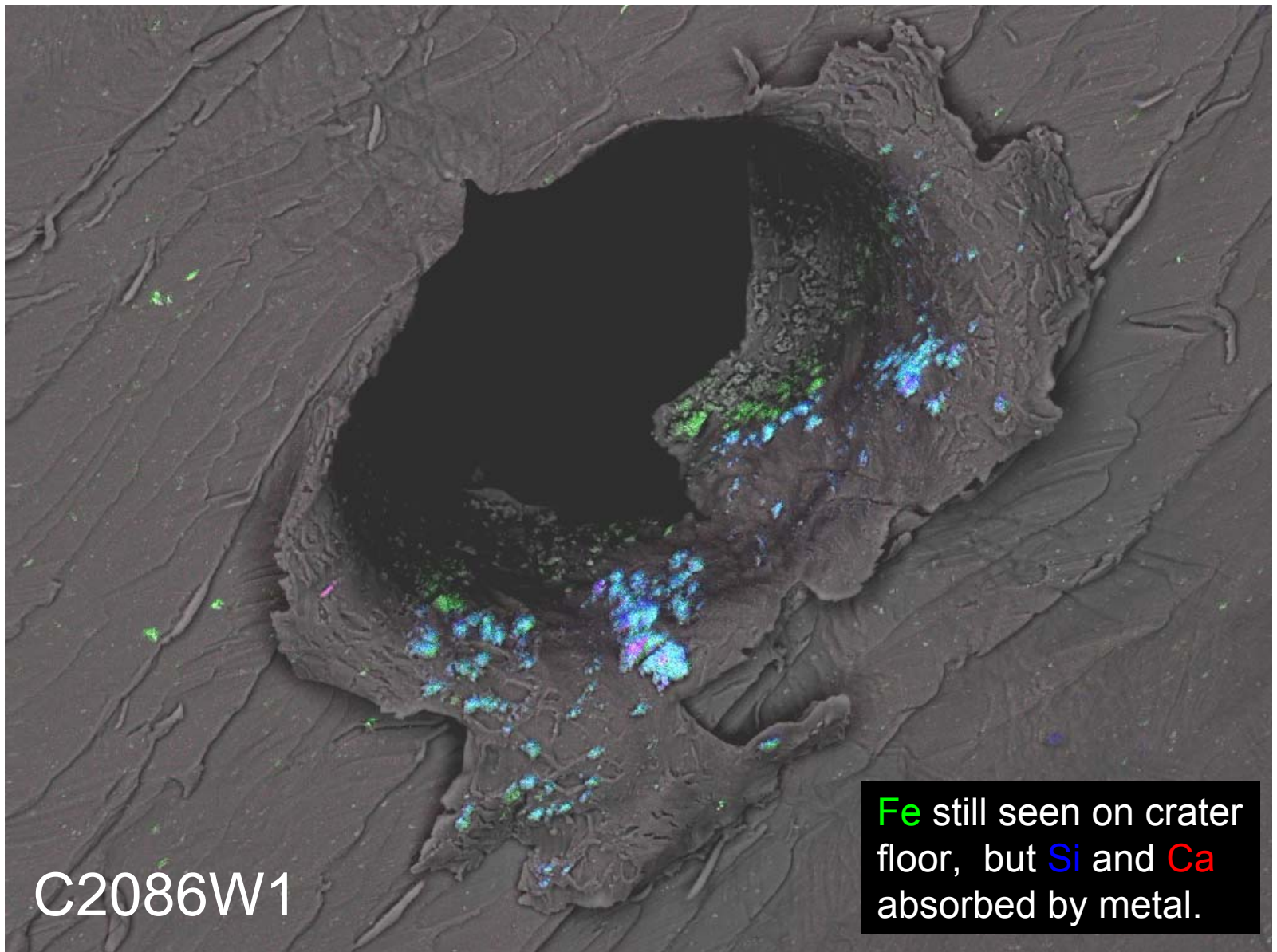
Residue (lots!)

C2086W1

60  $\mu\text{m}$

50 $\mu\text{m}$

Backscattered electron image (background) grey, maps: Si blue, Ca red, Fe green.



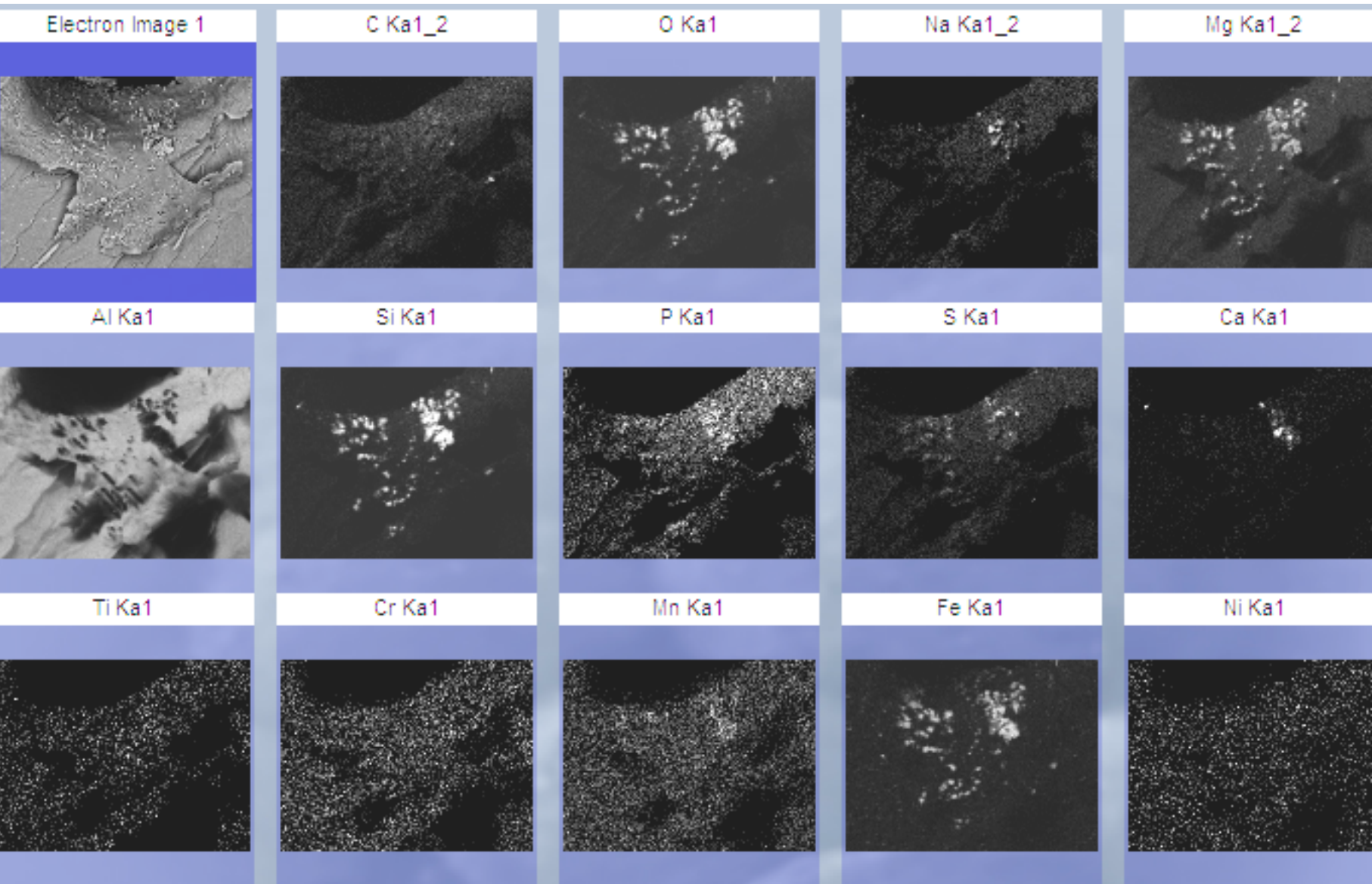
C2086W1

200µm

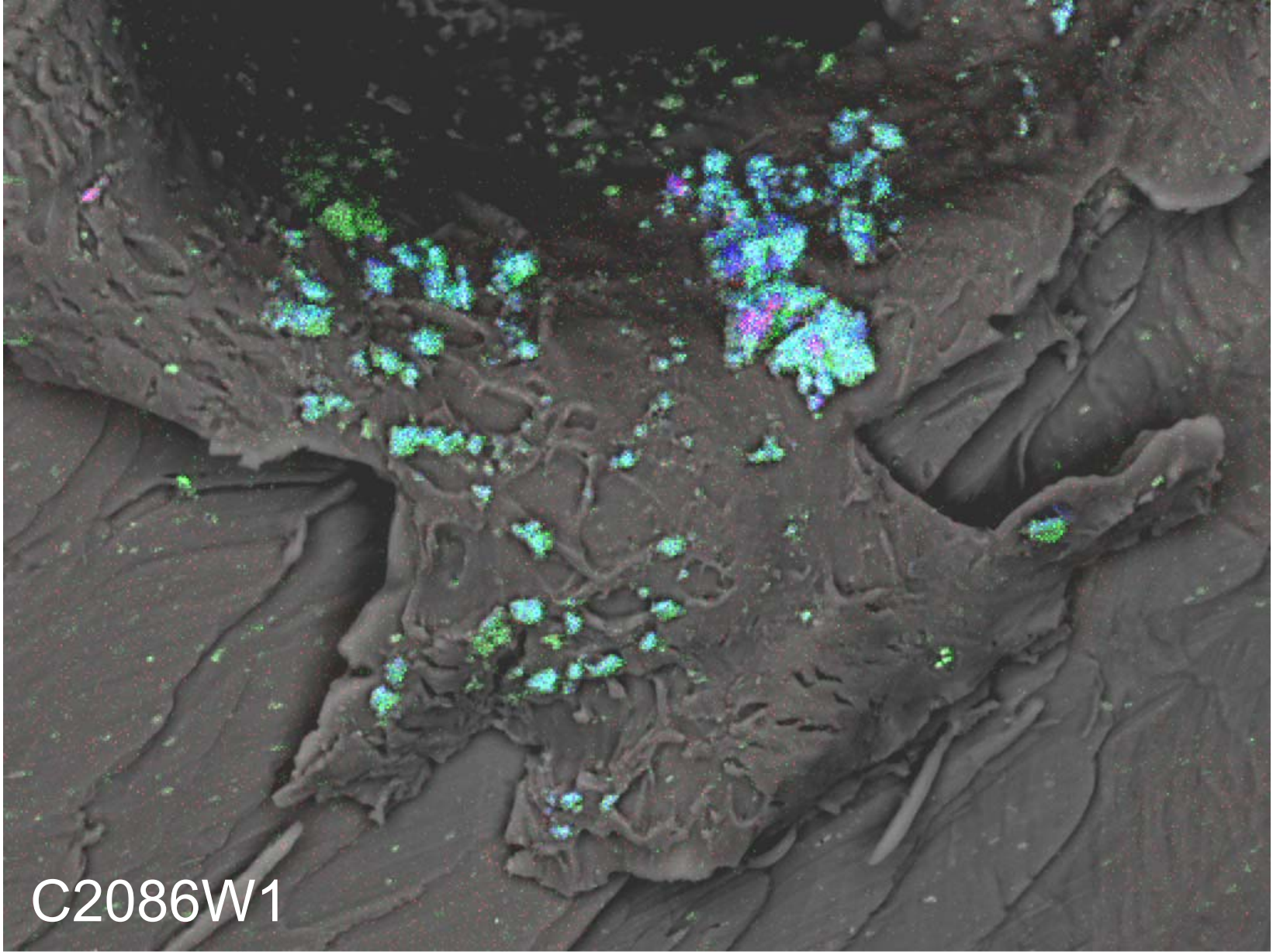
Fe still seen on crater floor, but Si and Ca absorbed by metal.

# C2086W1

Detailed maps of residue on lip, field of view is 251 micrometres wide.

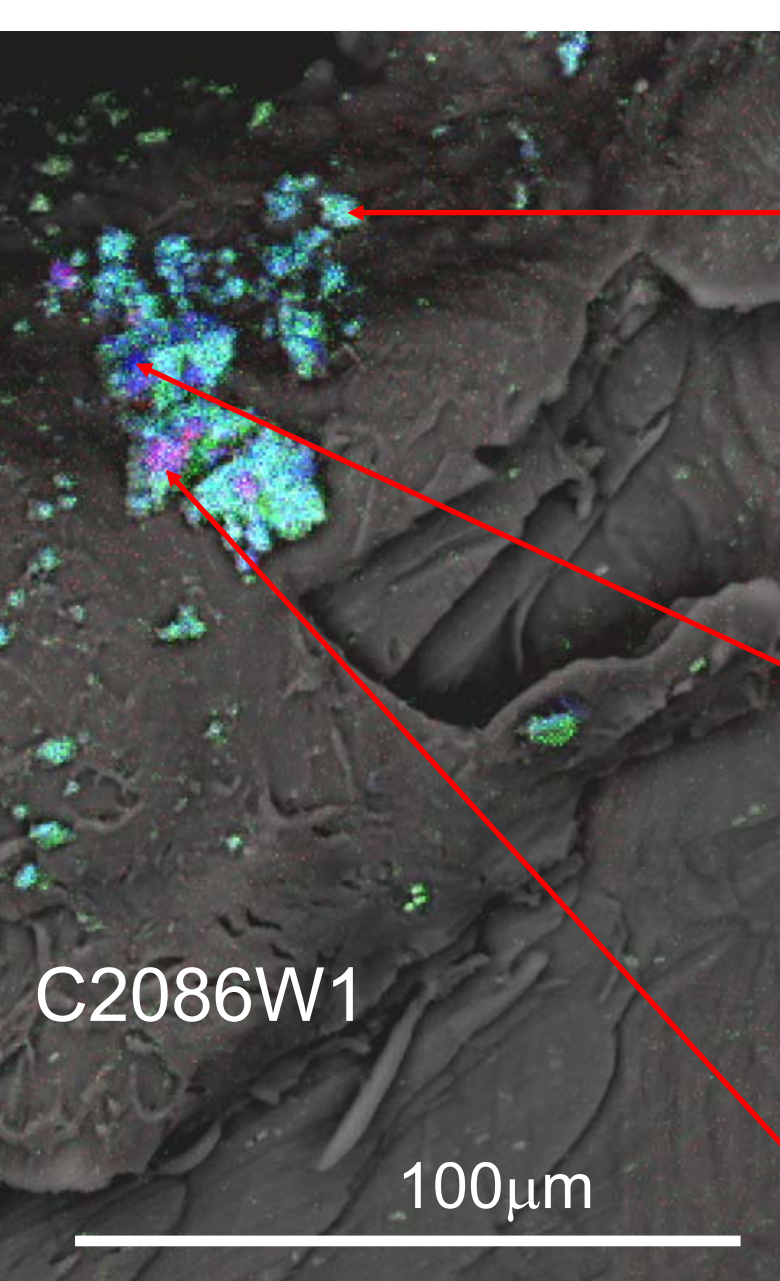


Backscattered electron image (background) grey, maps: Si blue, Ca red, Fe green.



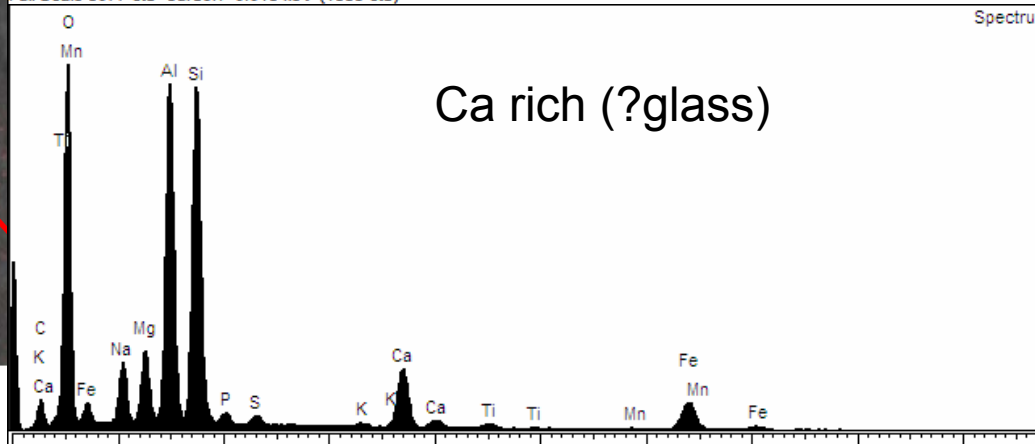
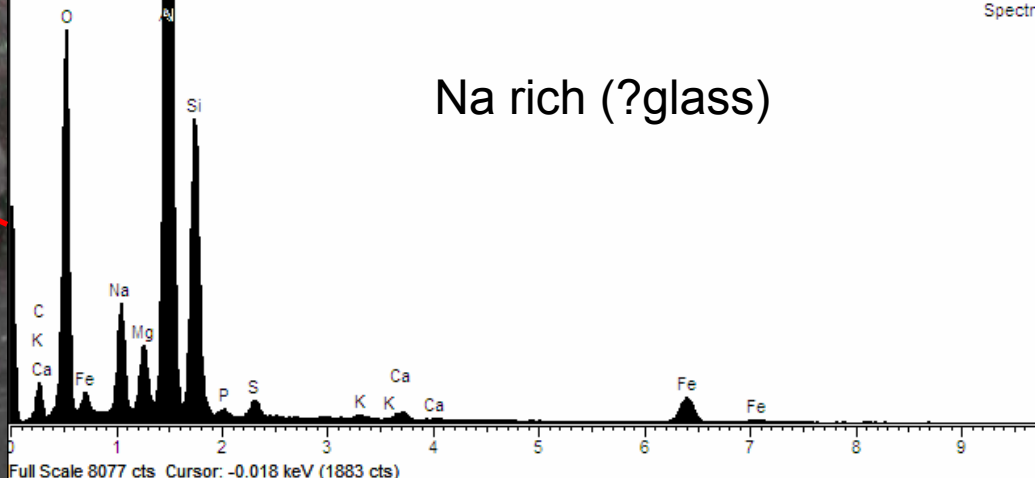
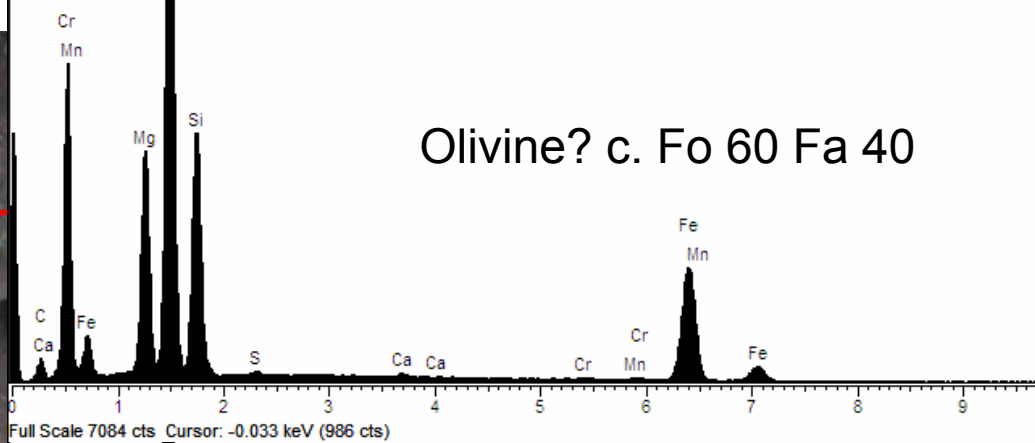
C2086W1

100µm



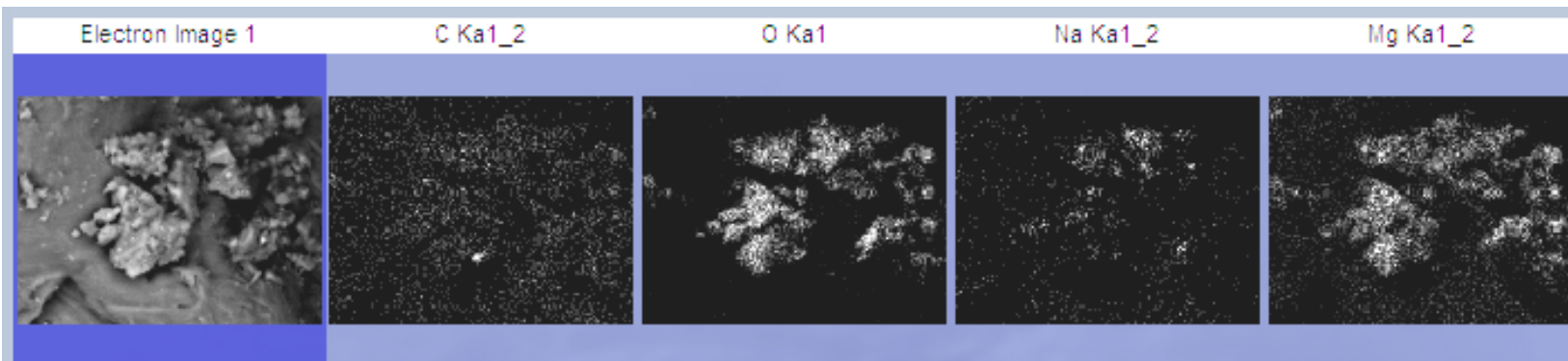
C2086W1

100 $\mu$ m

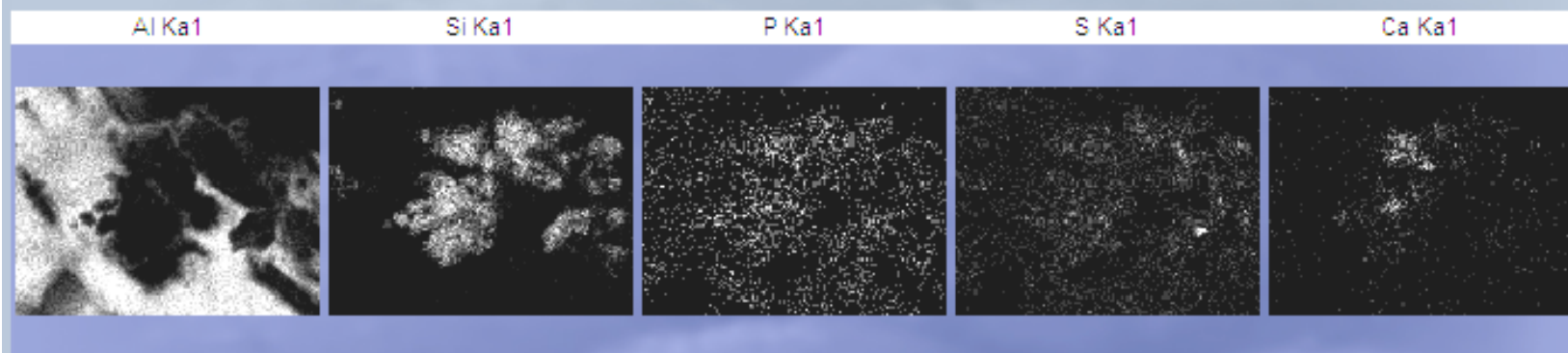




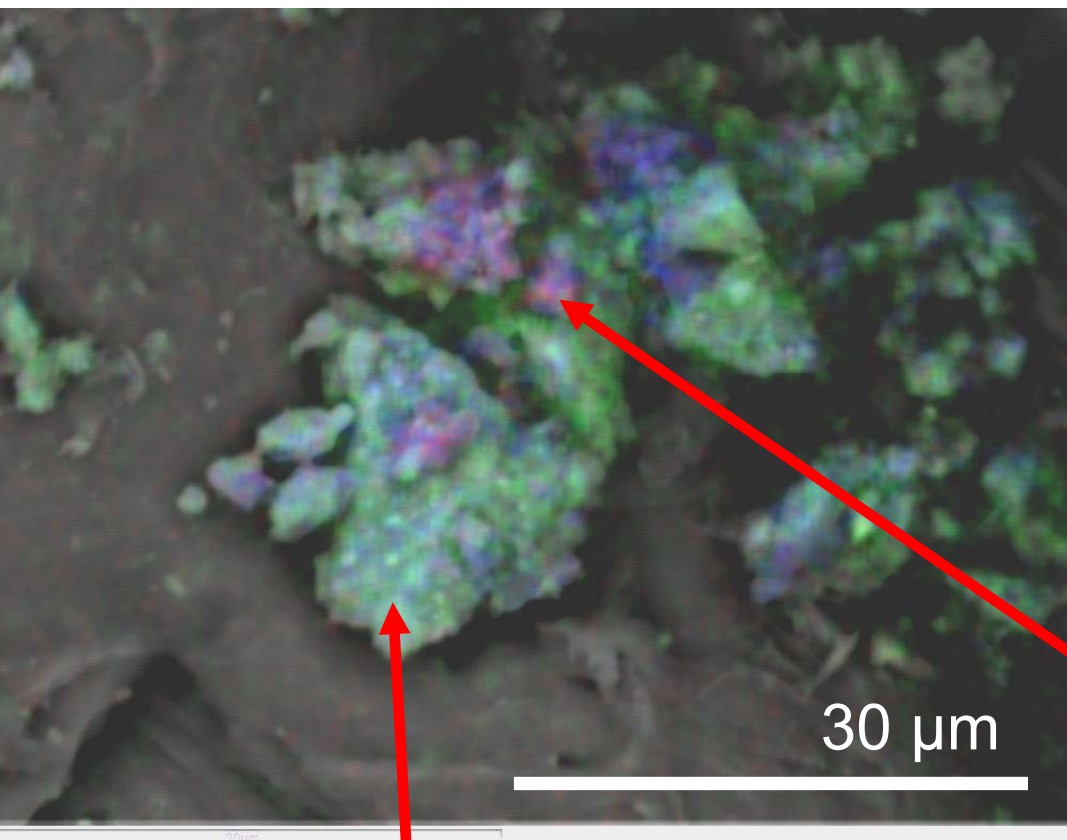
Detailed maps of residue on lip, field of view is 63 micrometres wide.



50  $\mu\text{m}$



C2086W1

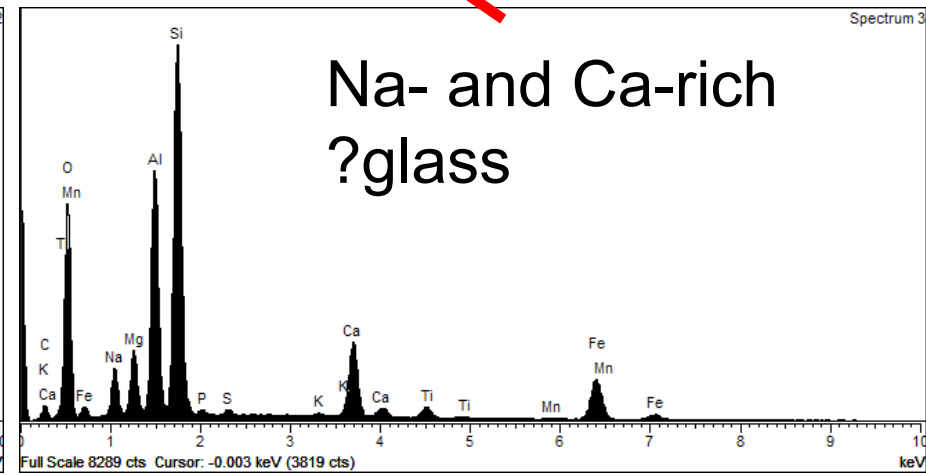
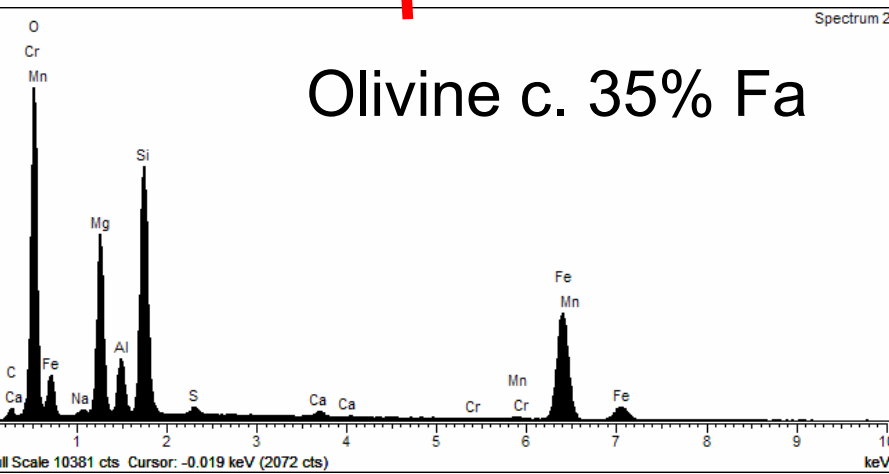


BEI grey  
with X-ray maps

Si blue

Ca red

Fe green



# C2086W,1

ak060420a site4 sp 4

Element	Weight%	Atomic%	Compound%	Formula	Ions
Mg	18.9	18.1	31.4	MgO	7.5
Si	17.2	14.2	36.8	SiO2	5.9
S	0.5	0.4	1.2	SO3	0.1
Ca	0.2	0.1	0.2	CaO	0.0
Cr	0.2	0.1	0.3	Cr2O3	0.0
Mn	0.4	0.2	0.5	MnO	0.1
Fe	23.1	9.6	29.7	FeO	4.0
O	39.6	57.5			24.0
Totals	100.0			Cation sum	17.8
(Mg+Ca+Cr+Mn+Fe-S):Si=		2.0			

Close to stoichiometric olivine, with Fo : Fa c. 65 : 35?

# C2086W,1

ak060420b site 6 sp 3 Na and Ca rich

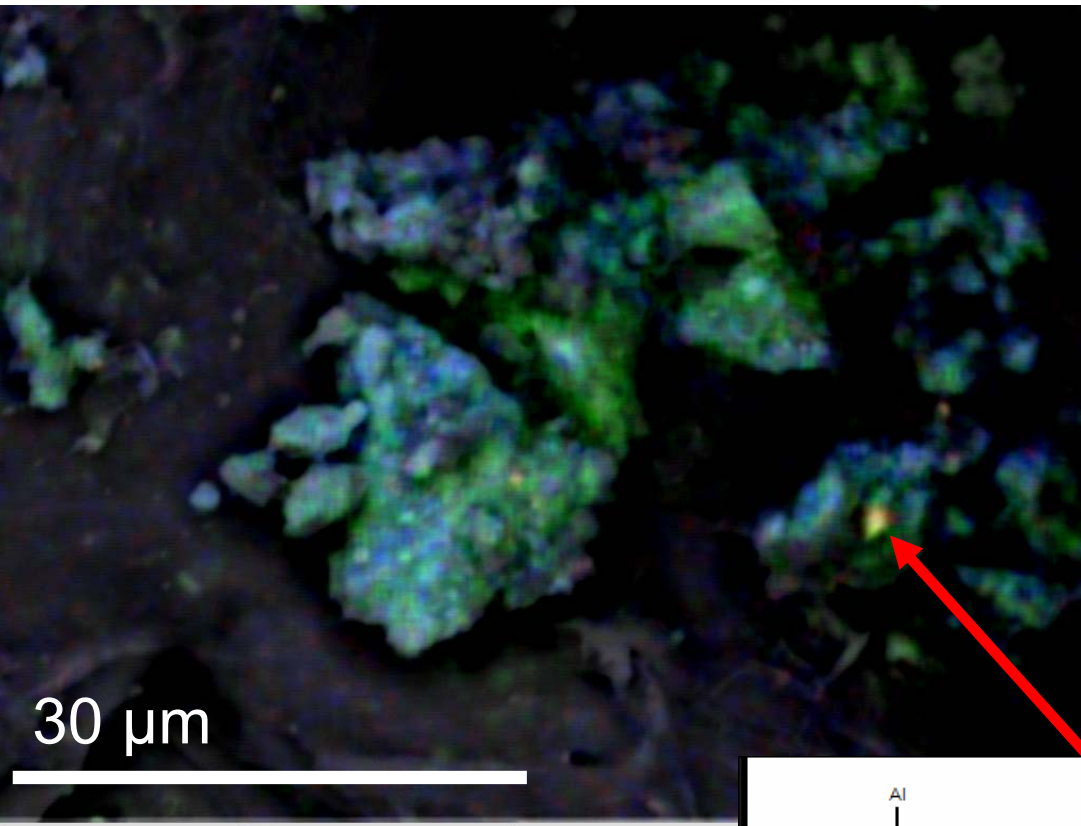
Element	Weight%	Wt% sigma	Atomic%	Compound%	Formula	Number of ions
Na	5.5	0.13	5.4	7.4	Na2O	2.2
Mg	6.2	0.1	5.7	10.3	MgO	2.3
Si	24.2	0.15	19.4	51.7	SiO2	7.9
P	0.3	0.05	0.2	0.8	P2O5	0.1
S	0.4	0.04	0.3	1.0	SO3	0.1
K	0.2	0.04	0.1	0.3	K2O	0.1
Ca	7.5	0.1	4.2	10.5	CaO	1.7
Ti	1.5	0.07	0.7	2.6	TiO2	0.3
Mn	0.2	0.07	0.1	0.3	MnO	0.0
Fe	11.8	0.17	4.7	15.1	FeO	1.9
O	42.1	0.21	59.1			24.0
Totals	100					

BEI grey  
with X-ray maps

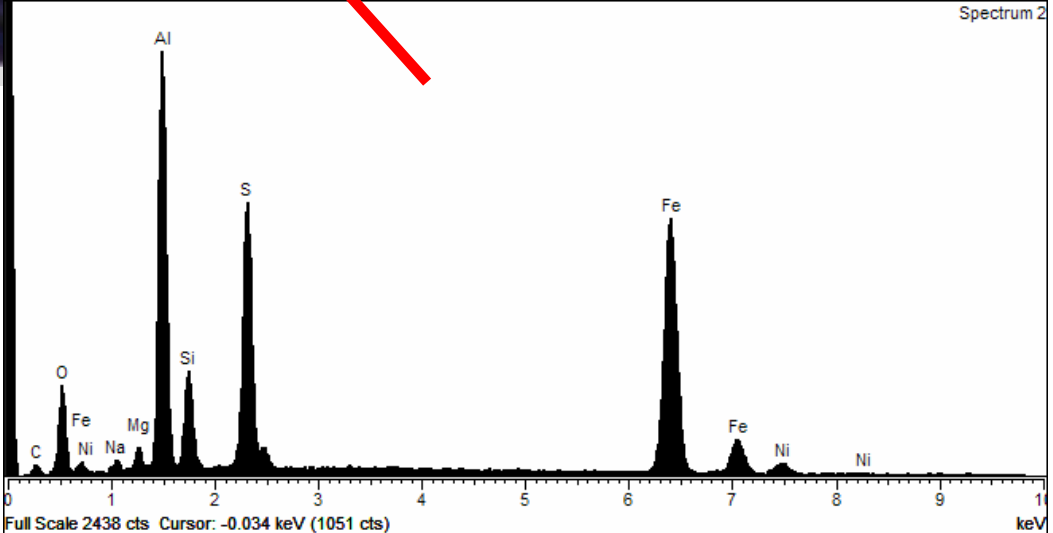
Mg blue

S red

Fe green



30 μm



Fe and Ni- sulfide

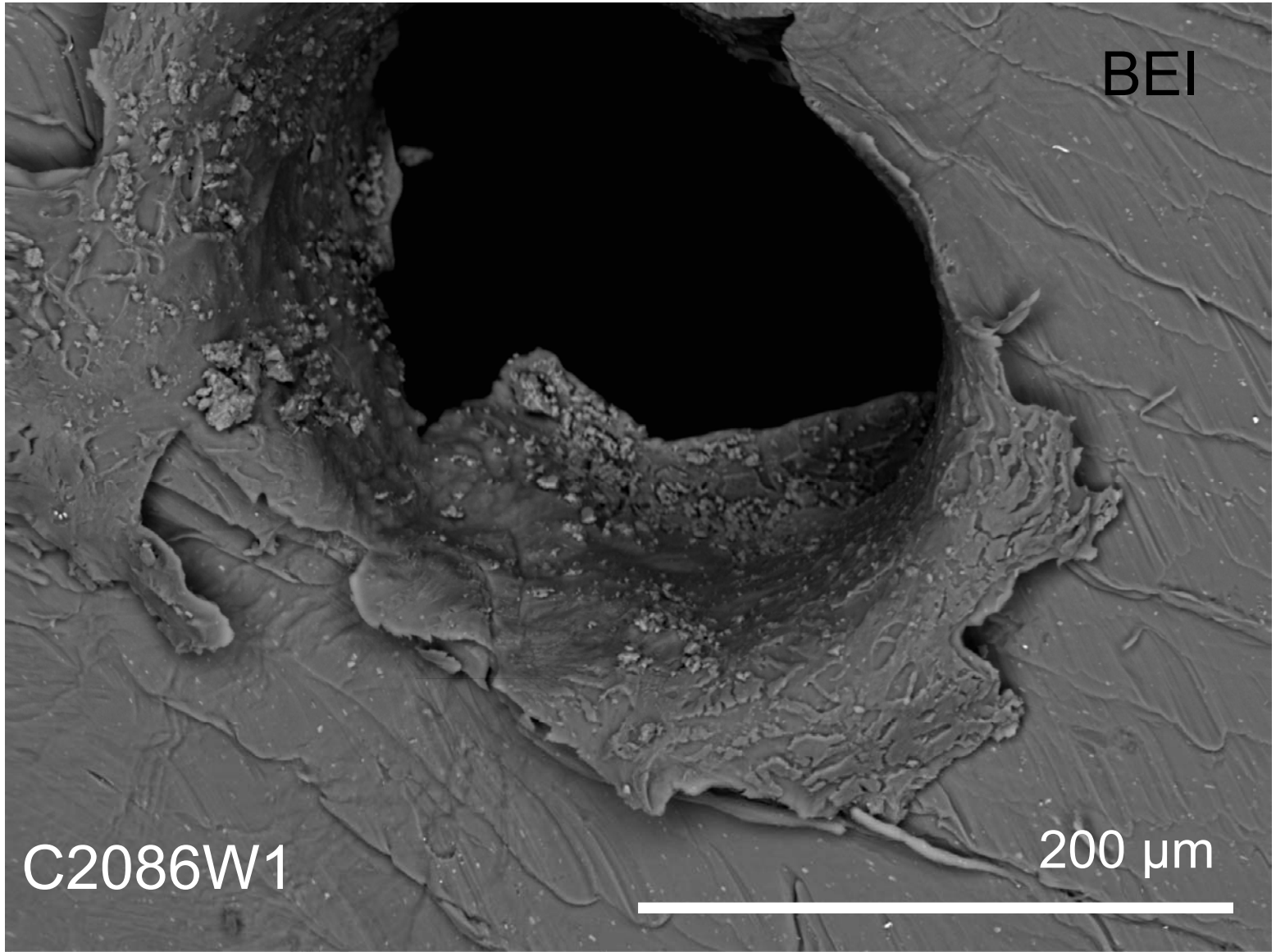
C2086W1

# Stardust foil C2086W,1

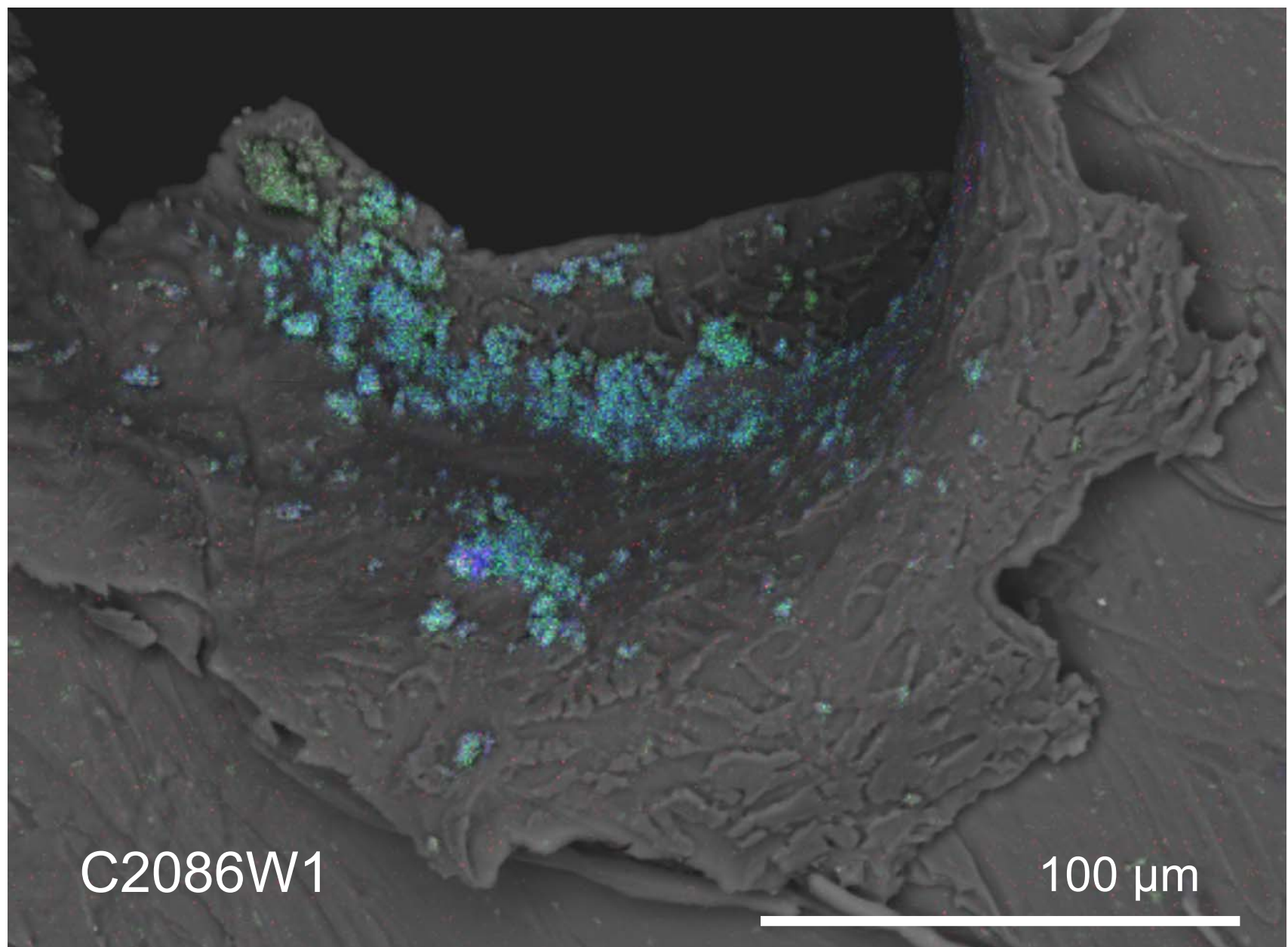
ak060420b site 7 sp 2 sulfide spectrum

Element	Weight%	Wt% sigma	Atomic%
S	19.3	0.3	29.5
Fe	75.9	0.4	66.5
Ni	4.8	0.4	4.0
Totals	100		

# Stardust foil C2086W1 rotated to show deep corner



Backscattered electron image (background) grey, maps: Si blue, Ca red, Fe green.



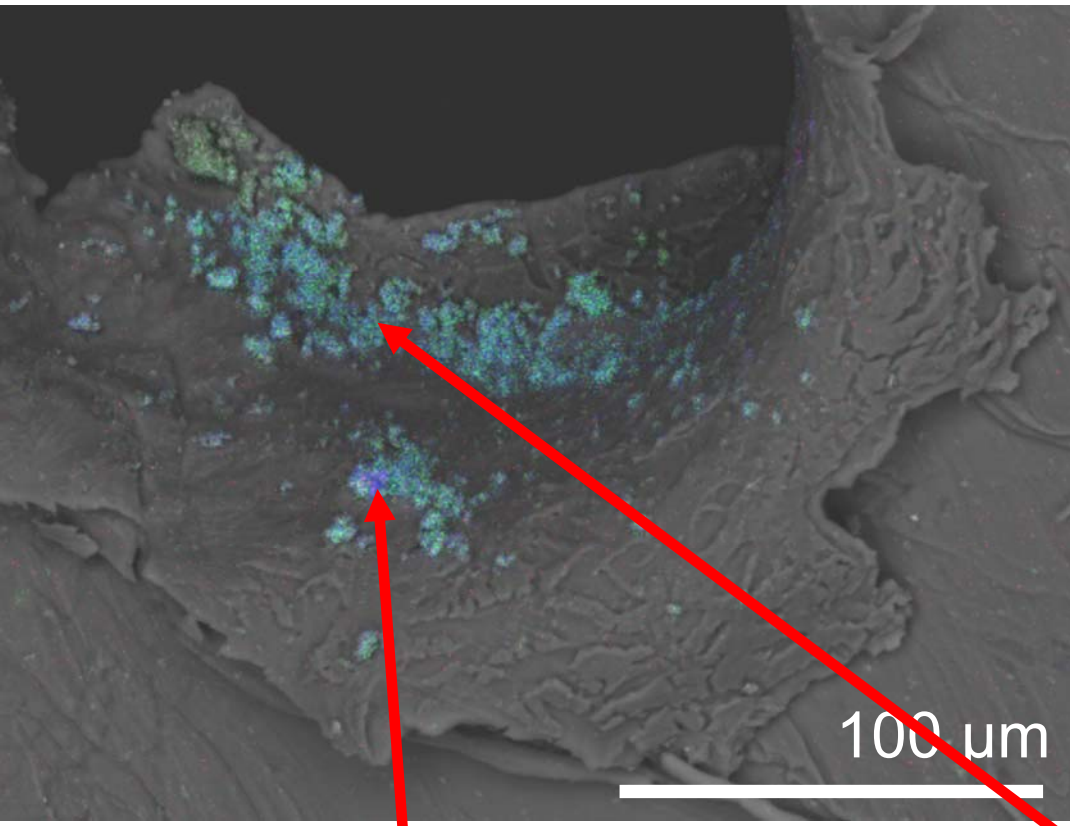
C2086W1

100  $\mu$ m



# C2086W,1

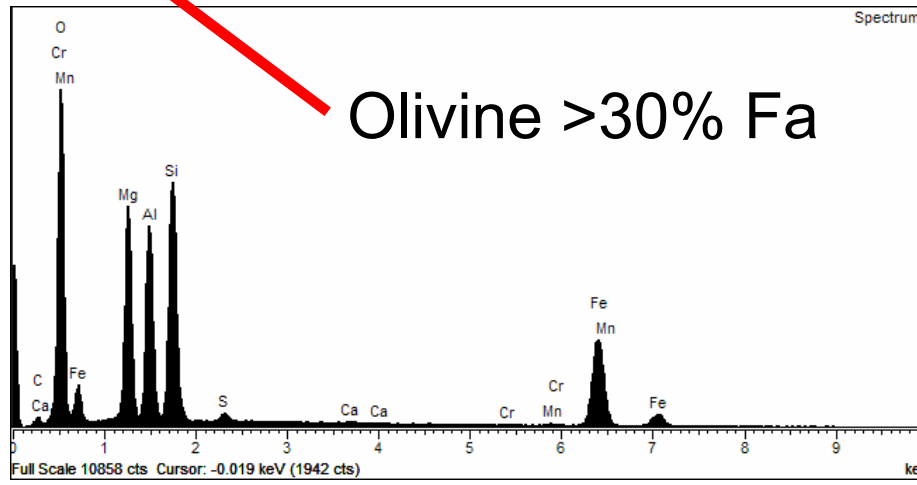
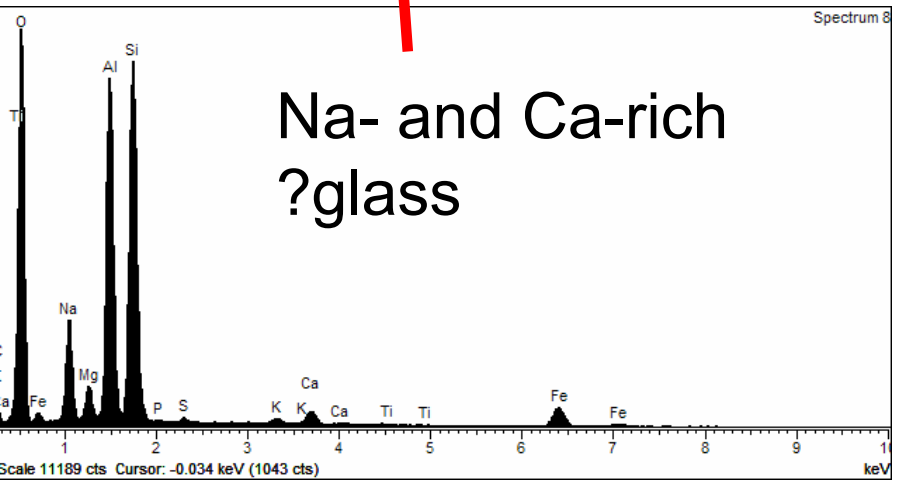
Backscattered electron image  
(background) grey,  
maps:  
Si blue, Ca red, Fe green.

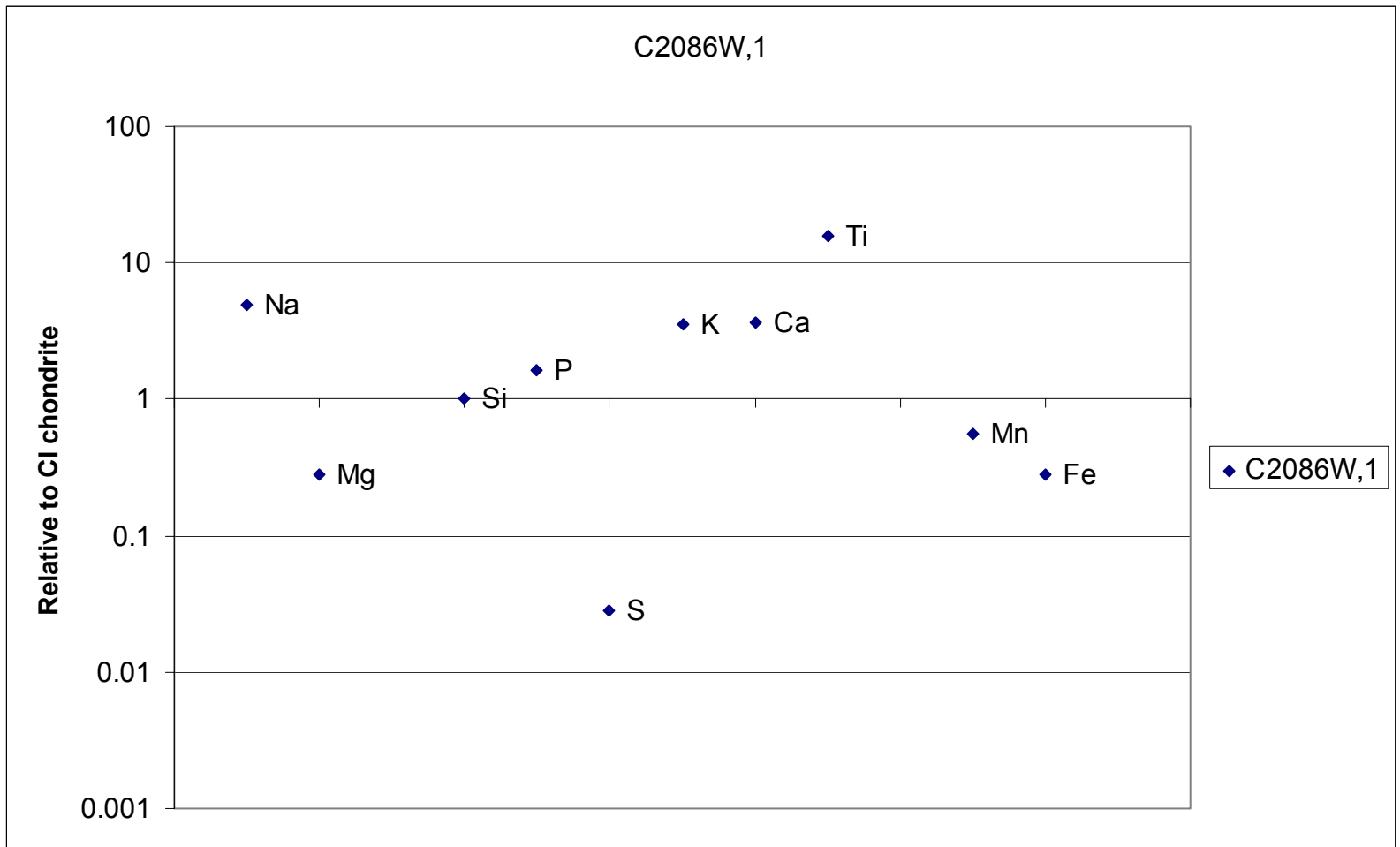


100  $\mu$ m

Na- and Ca-rich  
?glass

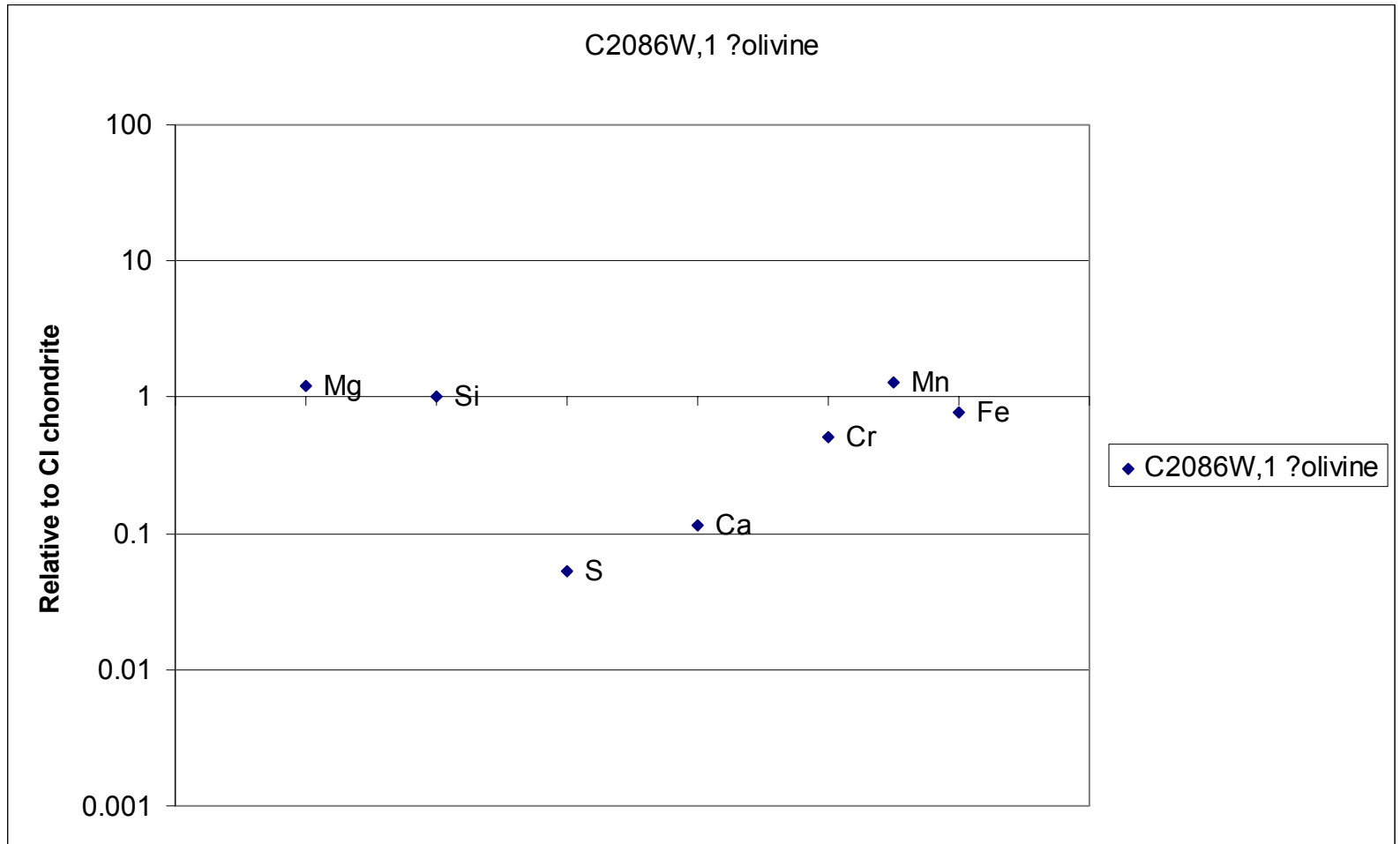
Olivine >30% Fa





C2086W,1

Na, K and Ca rich silicate



C2086W,1 Probable olivine with  $\text{Fo}_{65} : \text{Fa}_{35}$