

Stardust foil C2118N,1

A simple, bowl shaped, and fairly deep crater of c. 73 microns diameter, containing several different residues. Dominated by Na- and Ca-rich Mg silicate residue, several small iron sulfides, possible carbonate? Cupro-nickel contaminant?

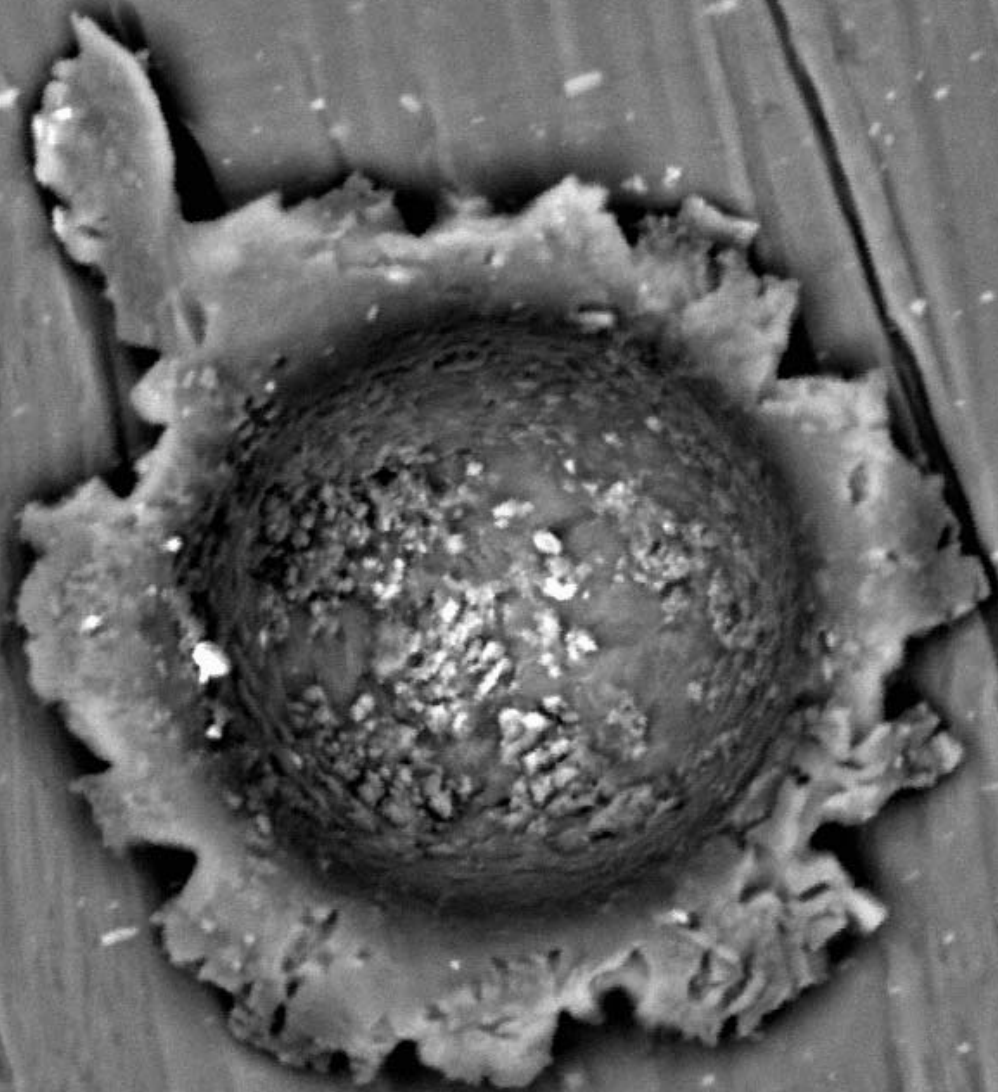
Electron imagery, Stereometric reconstruction, X-ray maps, Energy Dispersive X-ray spectra

Anton Kearsley

NHM May 2006

Sample returned to Frank Stadermann

BEI

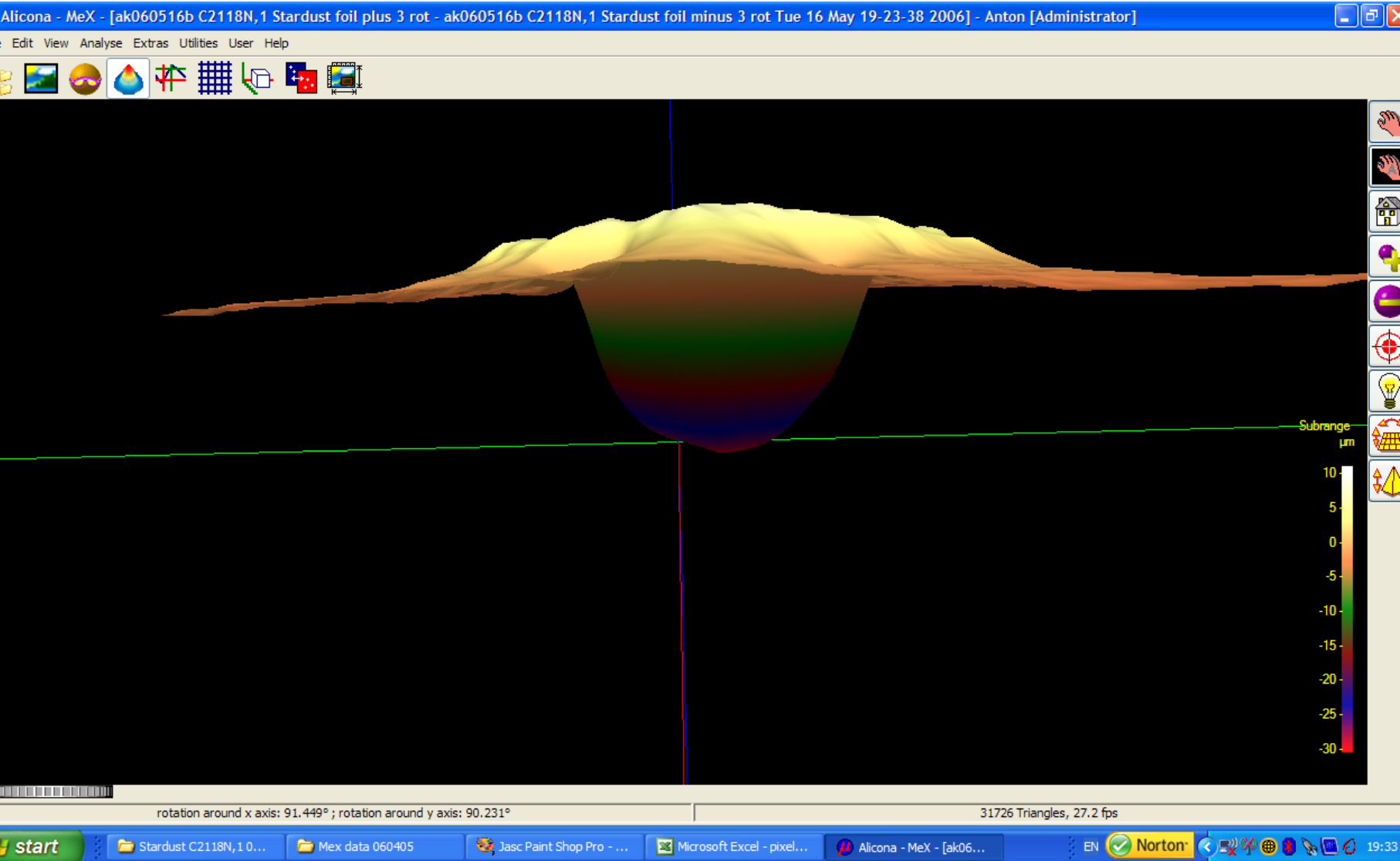


Stardust foil C2118N,1

70µm

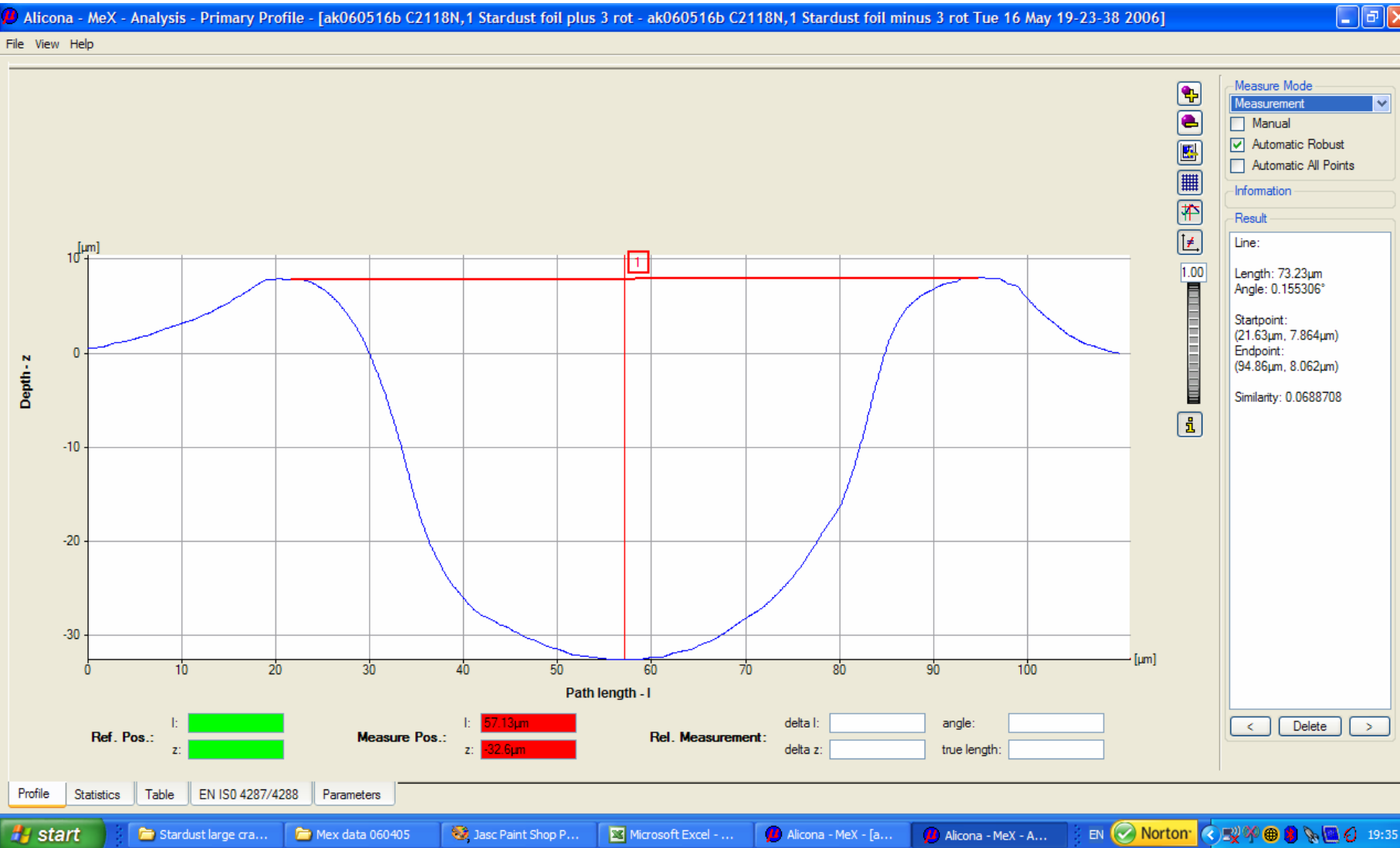
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depth model

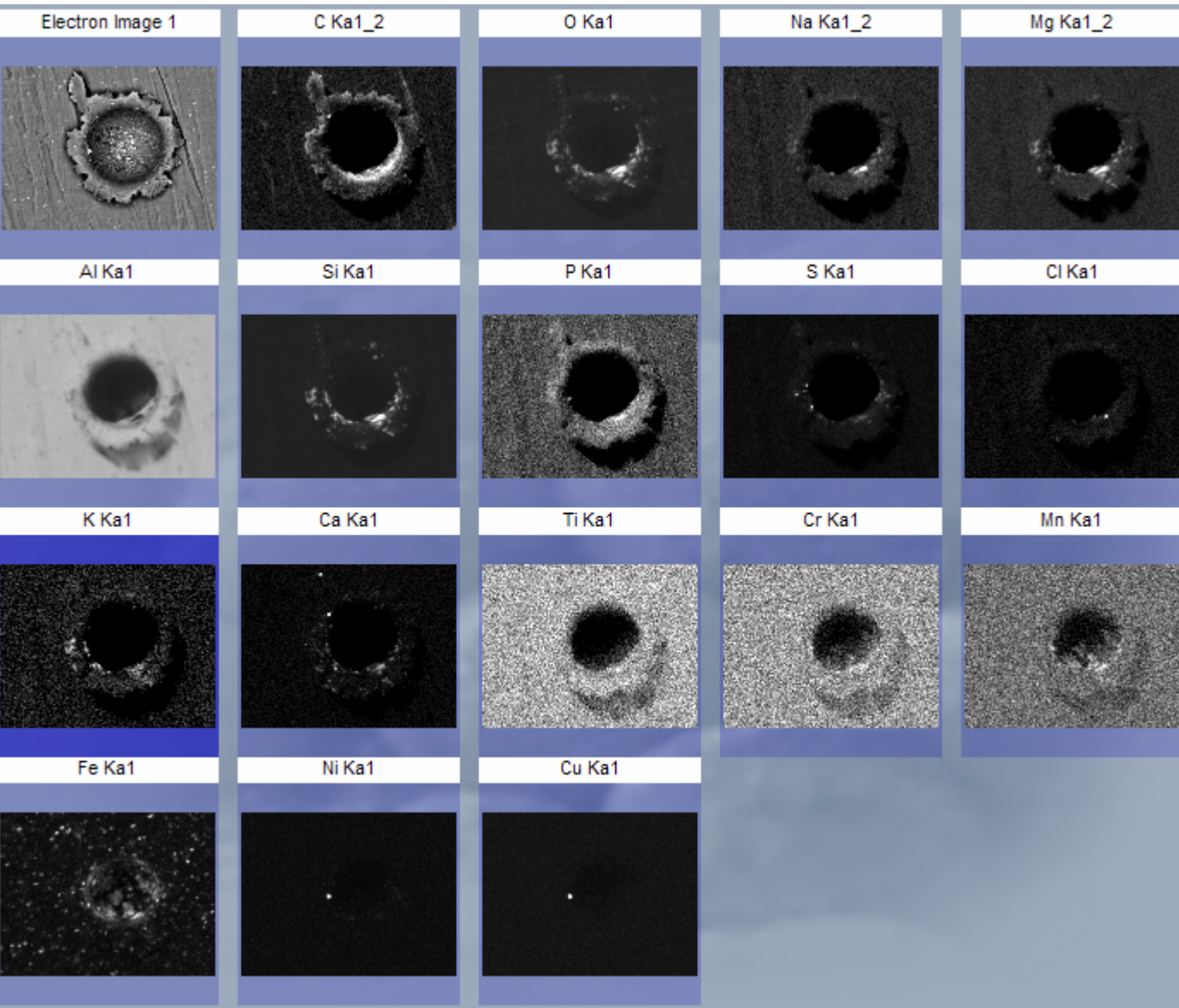


Stardust foil C21 18N, 1

depth profile

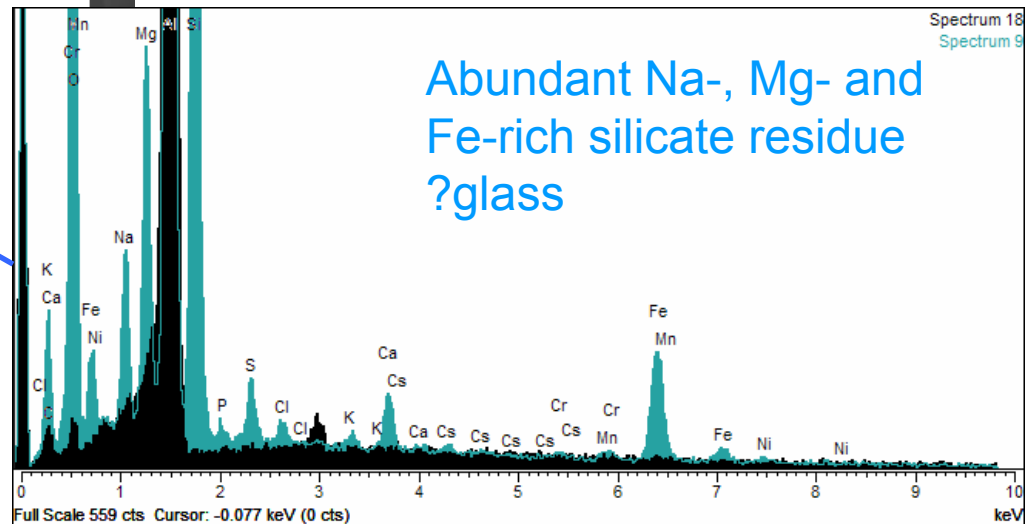
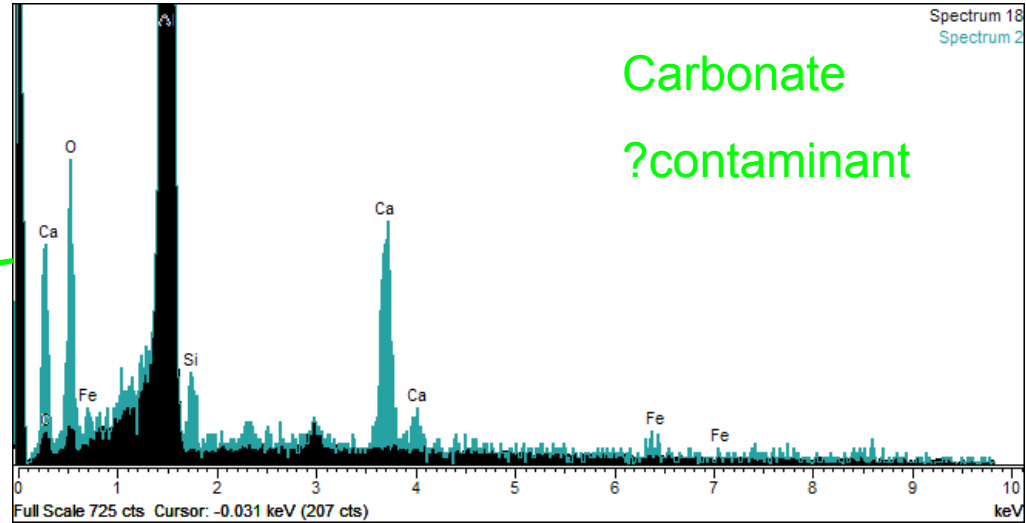
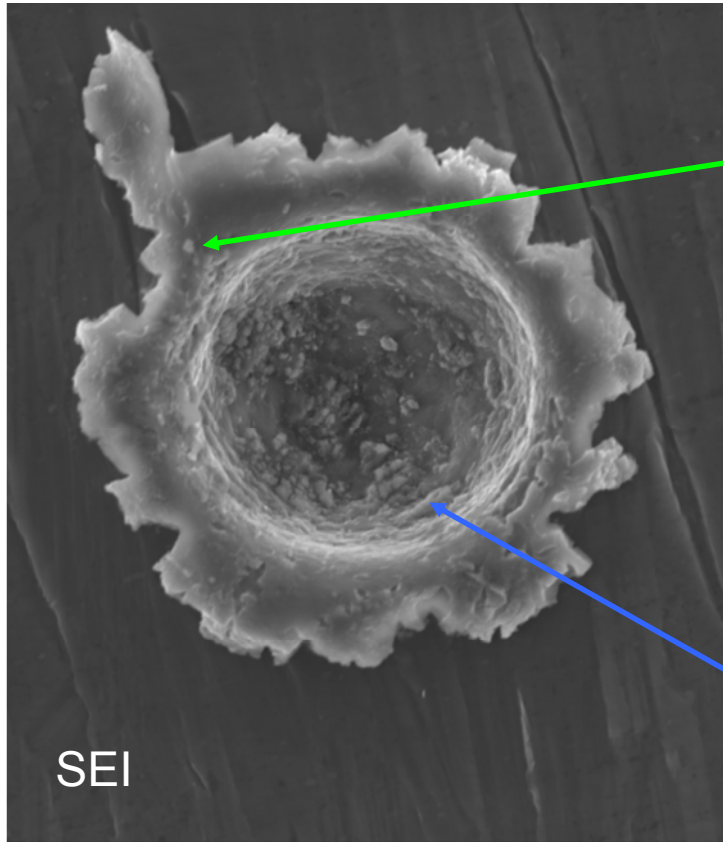


Stardust foil C21 18N, 1



X-ray maps from beam normal incidence reveal abundant residue around crater lip, walls and floor

Stardust foil C2118N,1



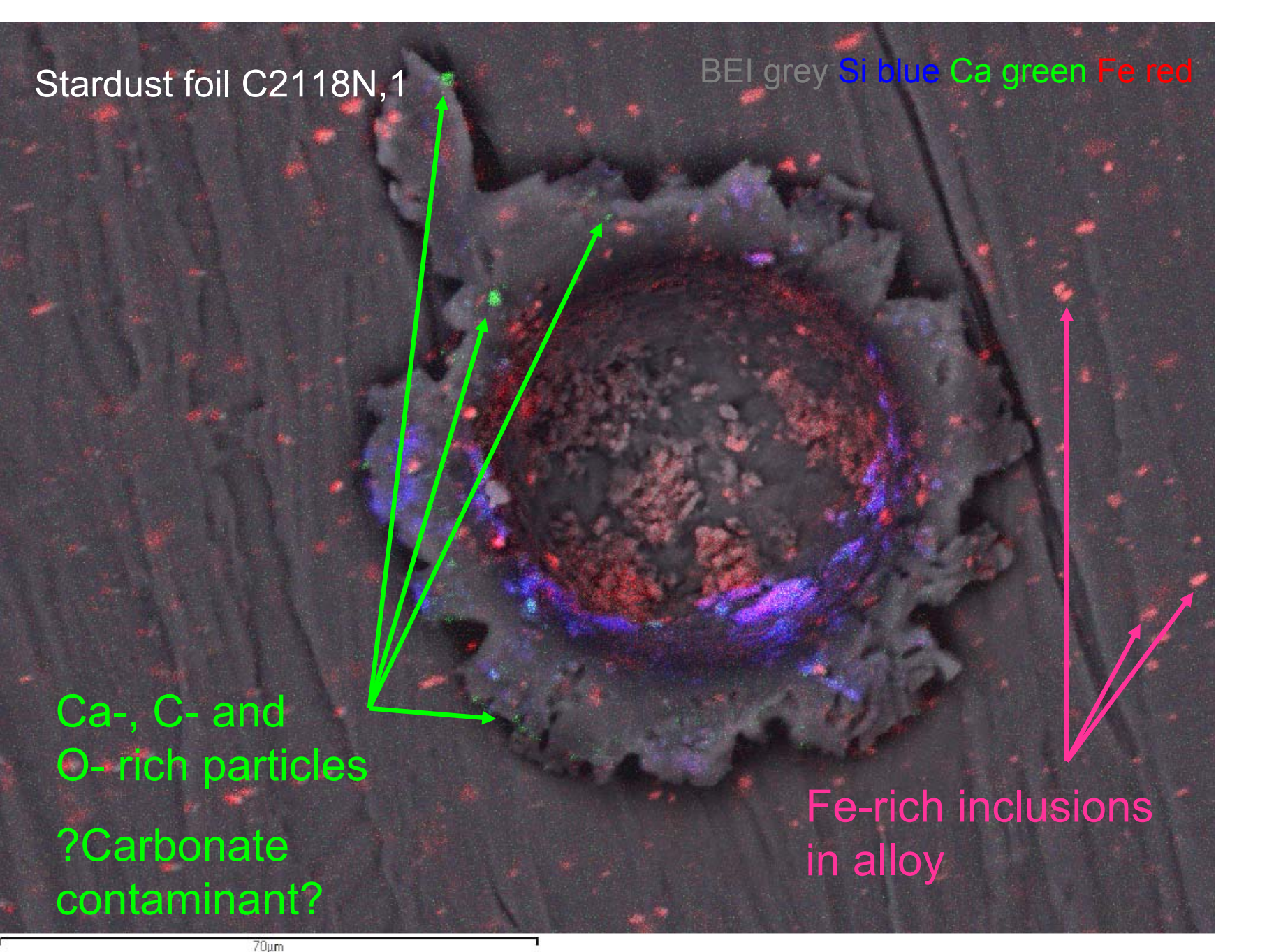
Stardust foil C2118N,1

BEI grey Si blue Ca green Fe red

Ca-, C- and
O- rich particles
?Carbonate
contaminant?

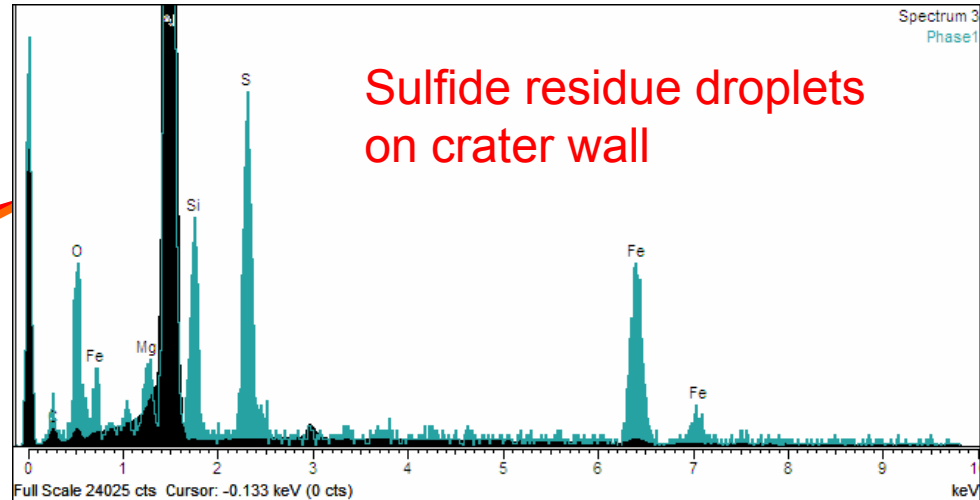
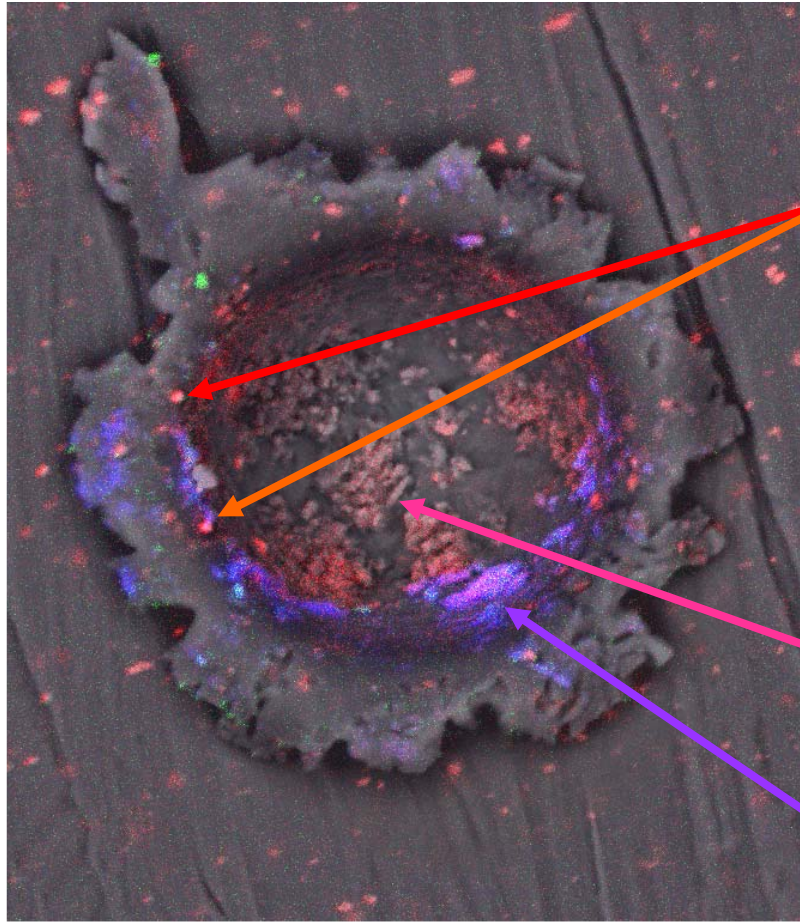
Fe-rich inclusions
in alloy

70µm



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BEI grey Si blue Ca green Fe red

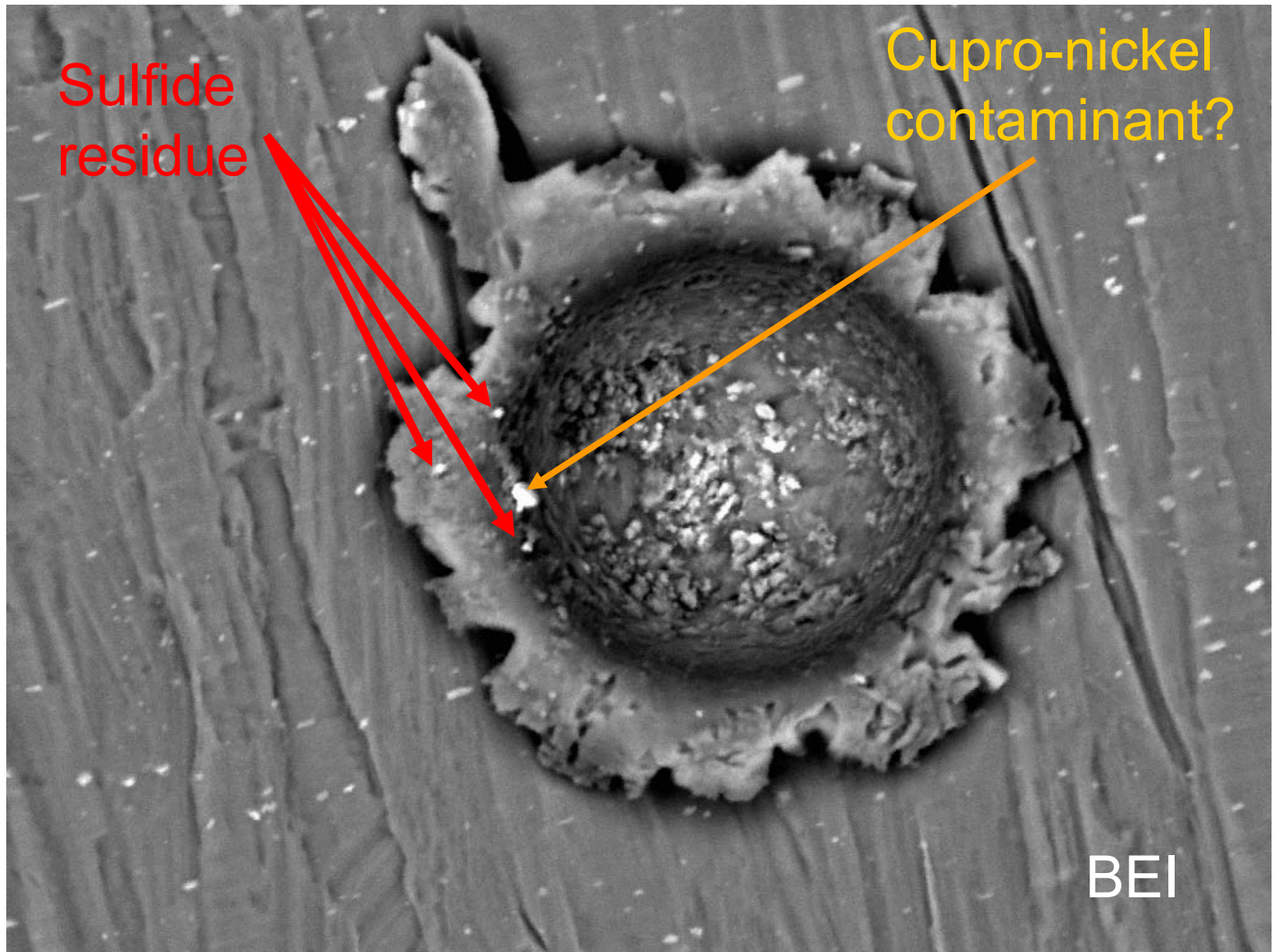


Pink areas on crater floor show Fe Ka X-rays from abundant silicate residue are able to escape from the 'shadow', but the Mg Ka and Si Ka cannot.

Purple areas show Mg Ka, Si Ka and Fe Ka are emitted from silicate residue on the crater wall.

Red areas outside the crater are Fe-rich inclusions in the alloy

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Sulfide
residue

Cupro-nickel
contaminant?

BEI

70um

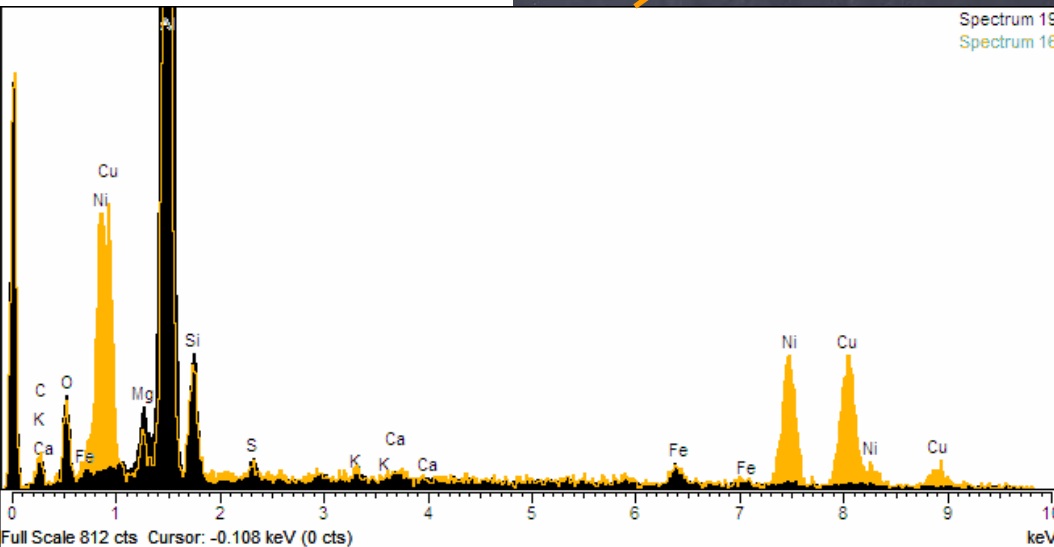
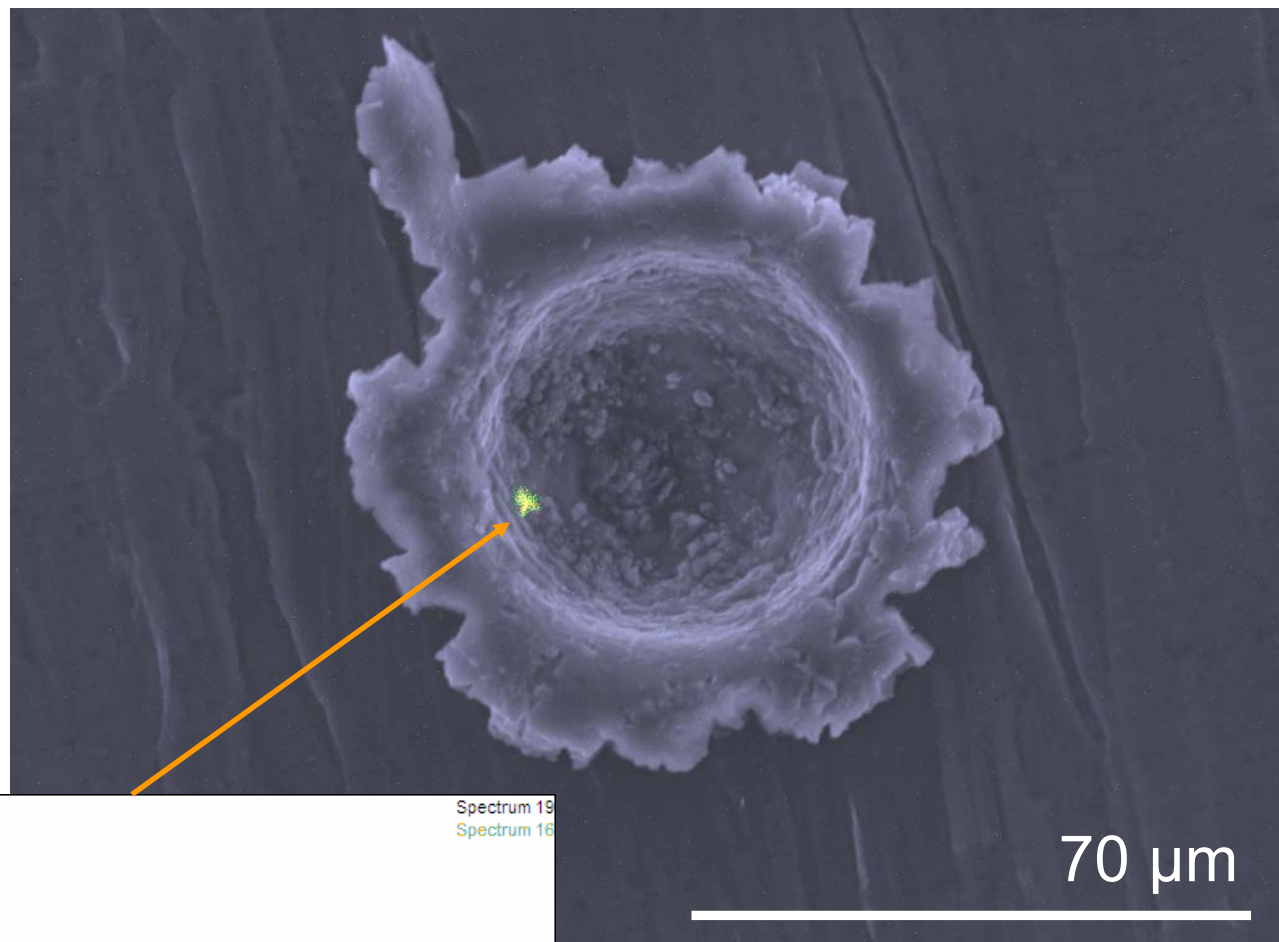
Stardust foil
C2118N,1

BEI grey

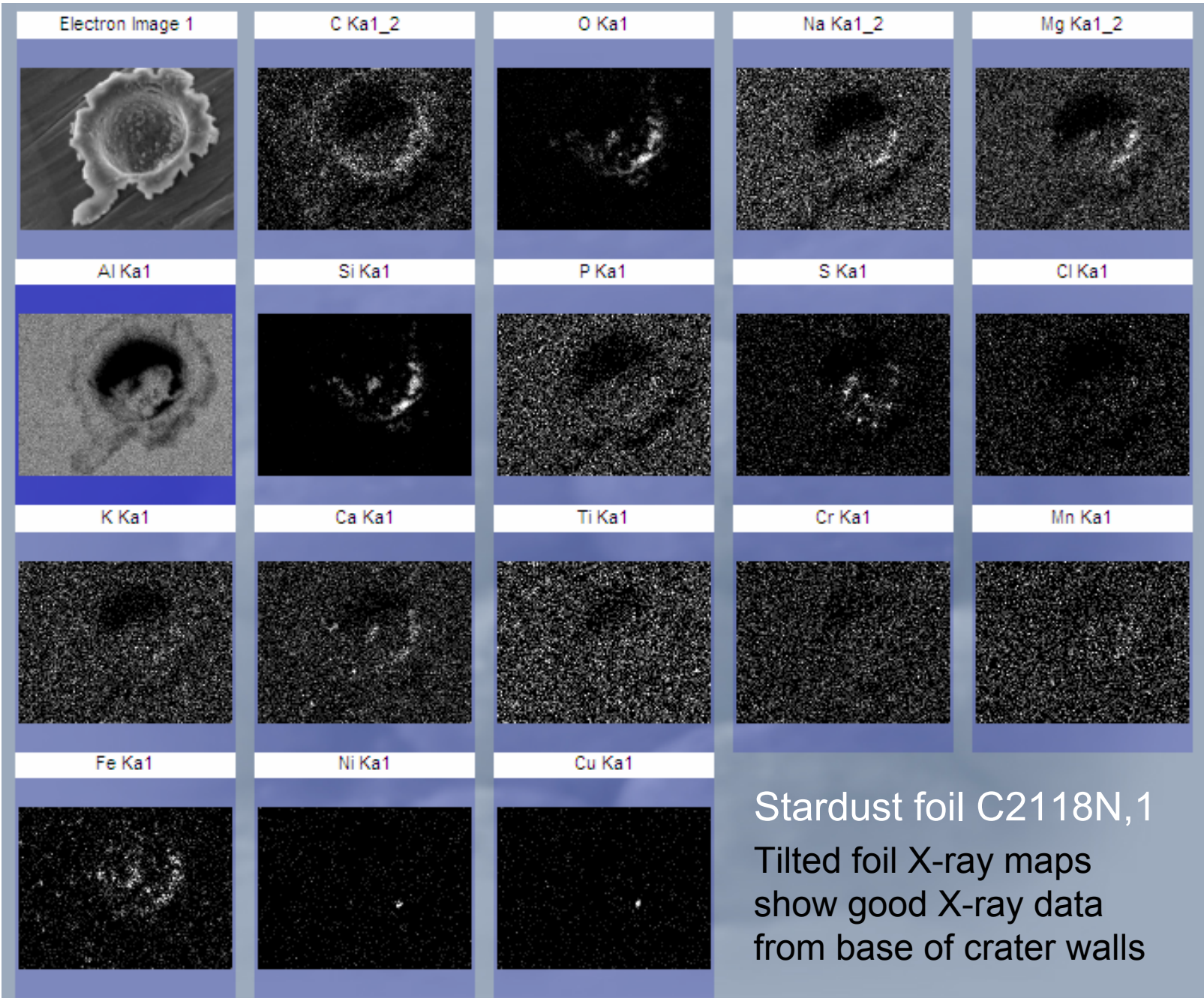
X-ray maps
for:

Cu red

Ni green

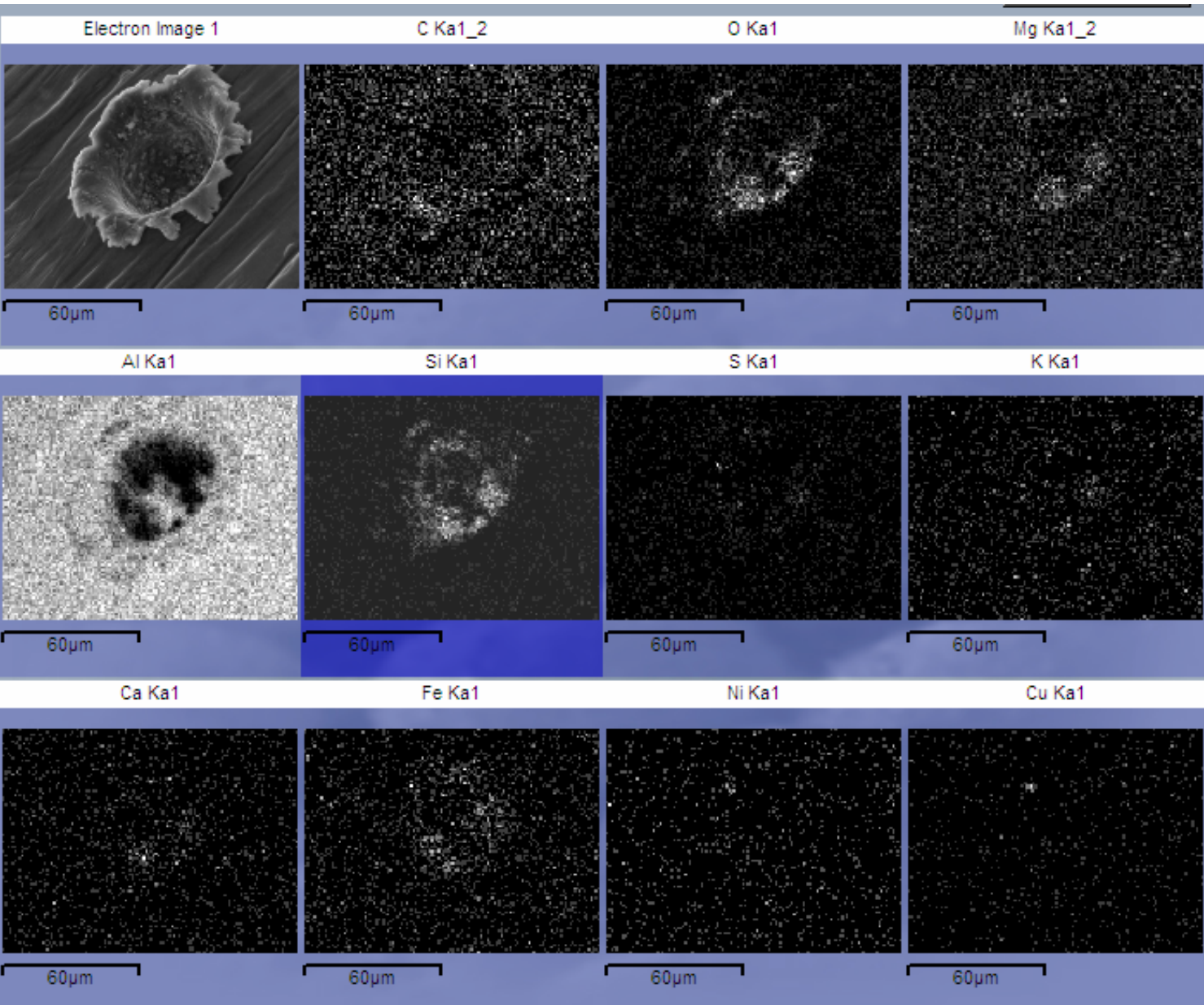


Cupro-nickel grain
Probable contaminant
or foil component?



Stardust foil C2118N,1
 Tilted foil X-ray maps
 show good X-ray data
 from base of crater walls

Stardust foil C2118N,1



X-ray maps of crater, tilted c. 30° in opposite direction to the previous slide.

Good X-ray collection allows spectra to be taken from the crater floor.

Stardust foil C2118N,1

SEI grey

Si pink

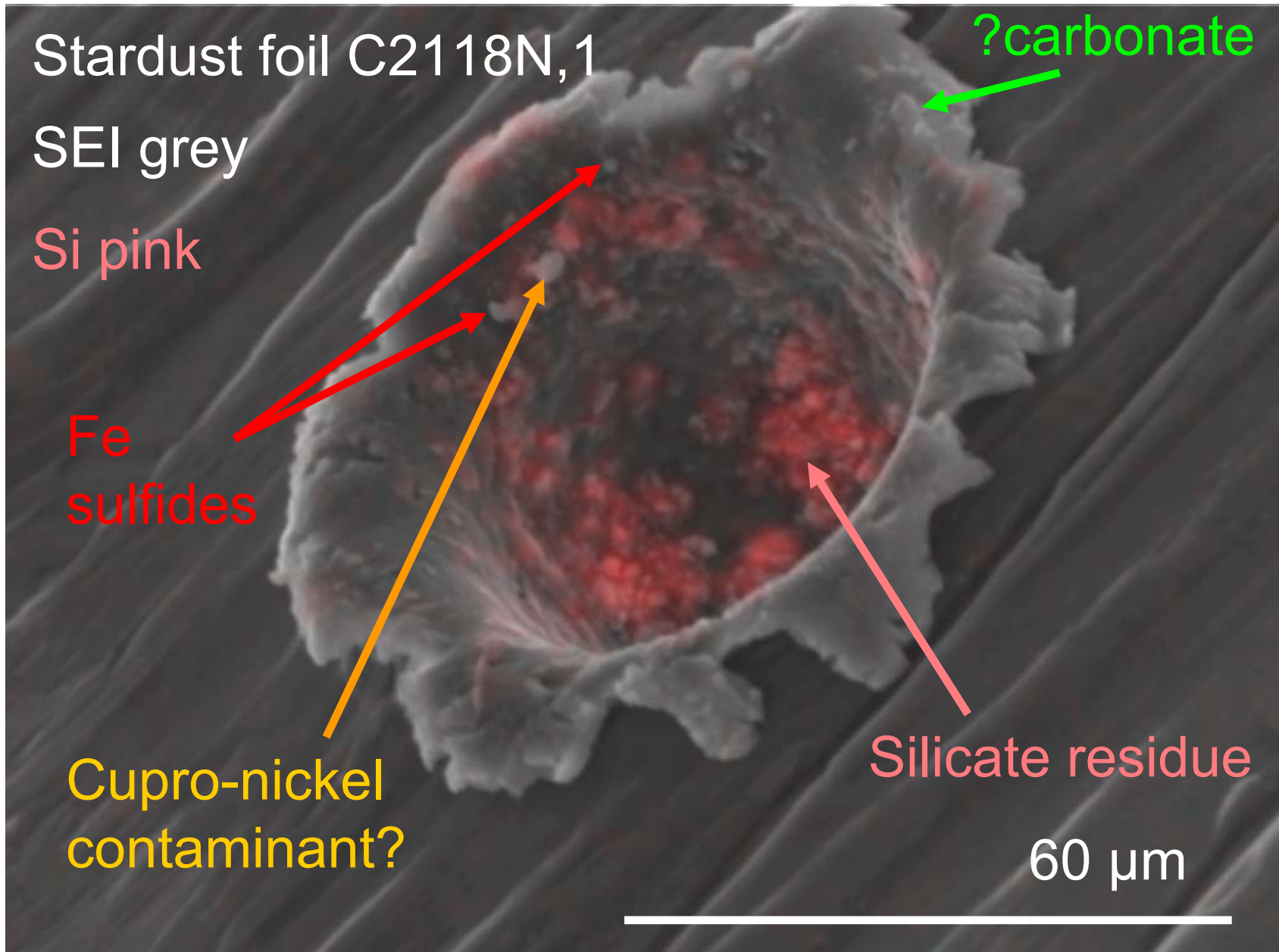
?carbonate

Fe
sulfides

Cupro-nickel
contaminant?

Silicate residue

60 μm

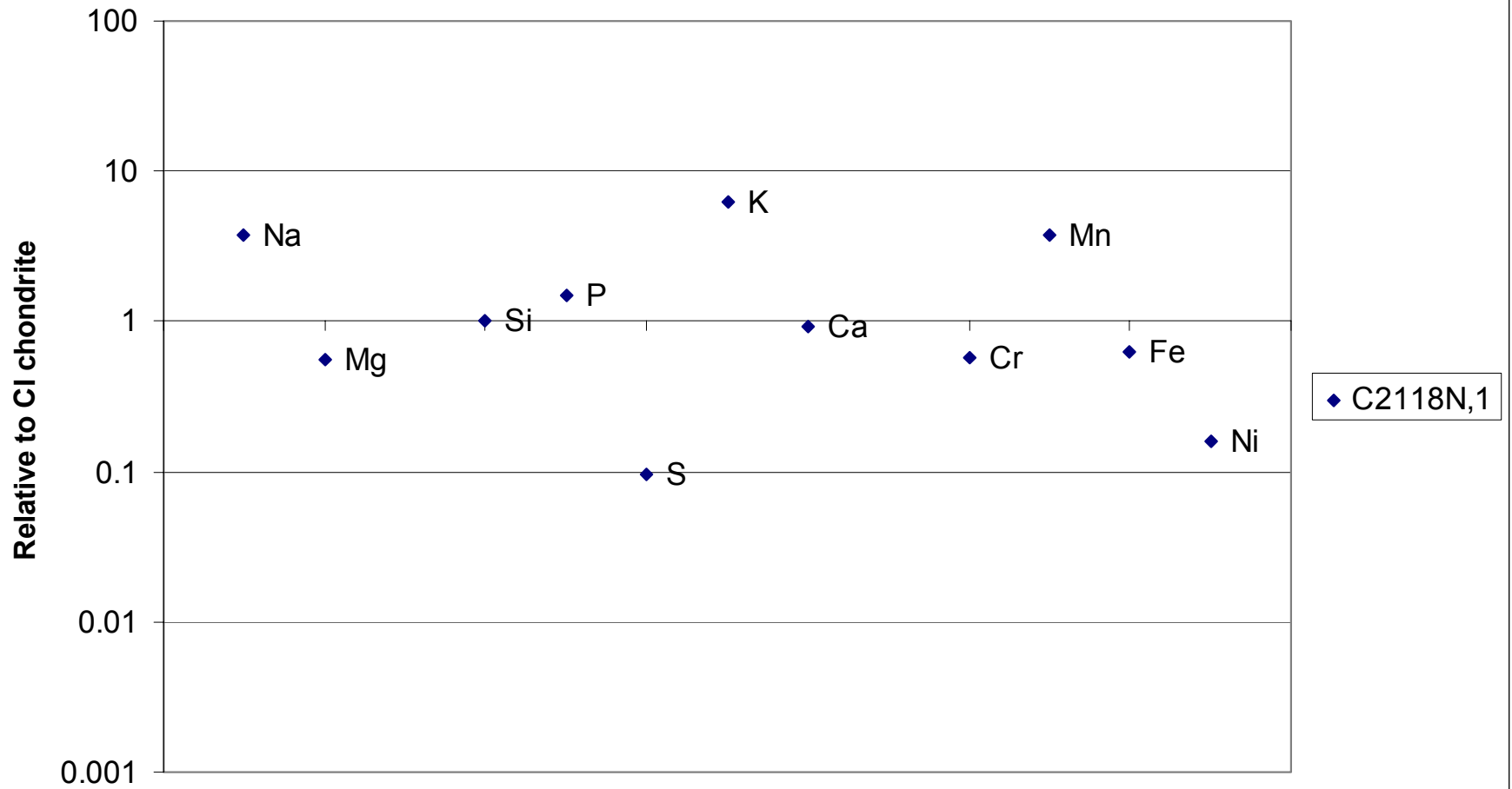


C2118N,1 9 analyses of alkali-rich silicate residue

Quantitative EDS, normalised, stoichiometry to Oxygen, tilted crater slope, near normal beam to specimen incidence.

Wt%										Avg wt %	sd
Na	3.7	4.1	4.7	3.8	4.7	4.3	4.6	4.3	5.0	4.3	0.4
Mg	11.2	12.0	10.9	10.2	11.9	15.2	13.6	13.5	12.4	12.3	1.6
Si	24.7	25.3	23.9	24.8	26.1	22.6	24.6	23.5	22.7	24.2	1.2
P	0.3	bdl	0.4	bdl	bdl	bdl	bdl	bdl	bdl	0.3	0.2
S	1.0	1.4	1.0	2.4	bdl	1.4	0.5	0.9	0.9	1.2	0.7
Cl	0.9	bdl	bdl	bdl	bdl	bdl	bdl	0.7	1.1	0.9	0.5
K	0.6	1.1	1.1	1.6	0.8	0.0	0.0	bdl	bdl	0.8	0.6
Ca	1.1	1.6	1.5	1.2	4.6	1.4	2.1	1.7	1.8	1.9	1.0
Cr	bdl	bdl	bdl	bdl	0.8	bdl	bdl	bdl	bdl	0.8	0.3
Mn	1.2	bdl	bdl	bdl	bdl	1.0	1.1	1.2	1.1	1.1	0.6
Fe	11.6	9.7	12.3	11.5	7.4	10.2	8.9	10.1	11.2	10.3	1.5
Ni	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl	bdl
O	43.0	44.0	42.7	44.1	43.7	43.4	43.5	42.5	41.4	43.2	0.8
	99.2	99.2	98.6	99.4	100.0	99.4	98.8	98.4	97.5	99.0	

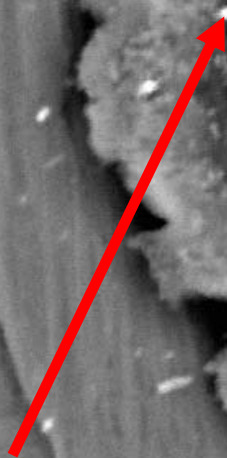
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Average of 9 normalised EDS analyses from silicate residue on tilted crater floor , atomic proportions relative to 1 Silicon, normalised to CI chondrite (Lodders, 2003; Allende Prieto et al., 2001).

BEI

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ak060516c processed 060517 sp 12 sulfide from map

Element	Weight%	Weight% sigma	Atomic%
S	23.9	2.1	35.4
Fe	76.1	2.1	64.6