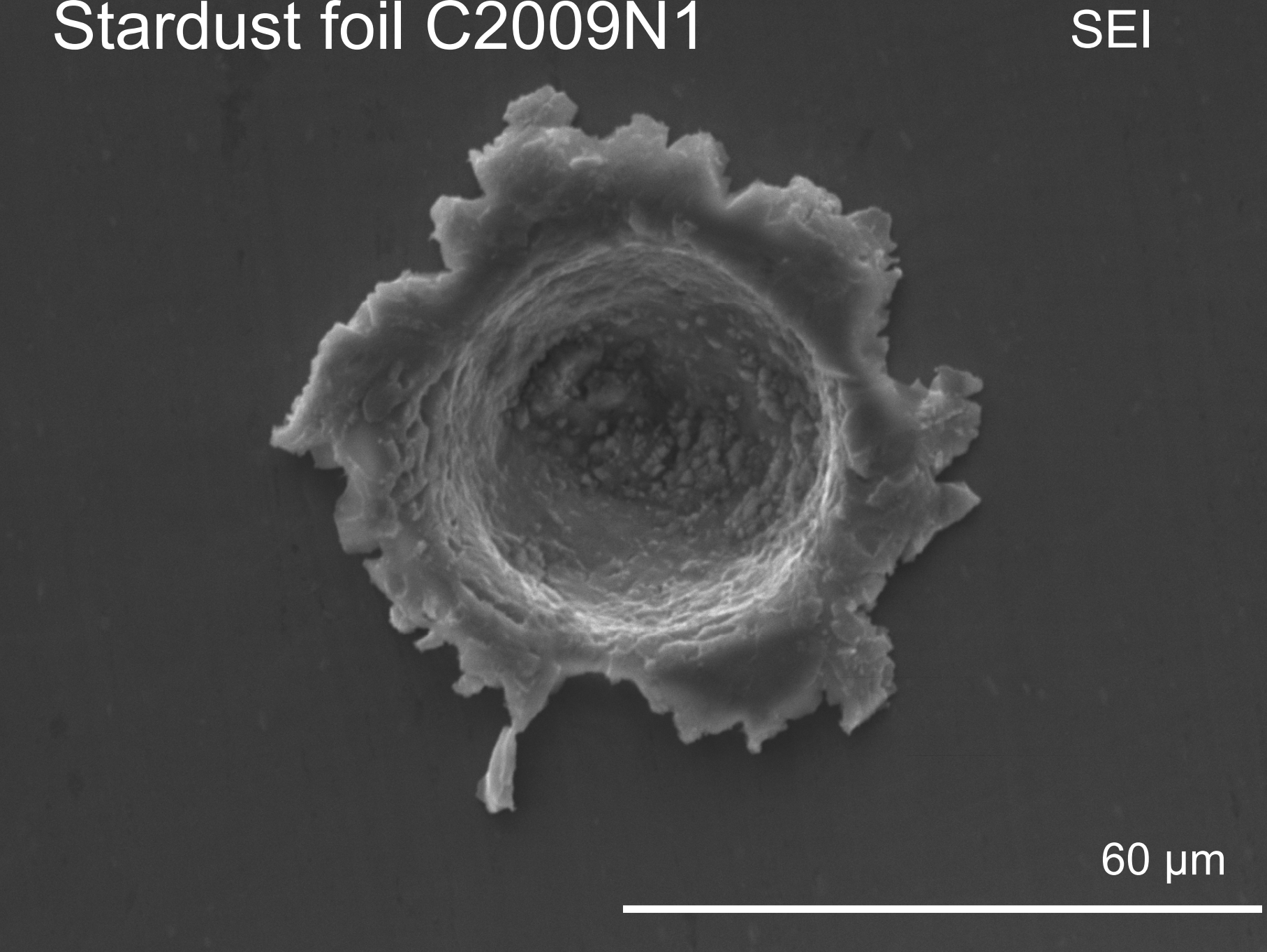
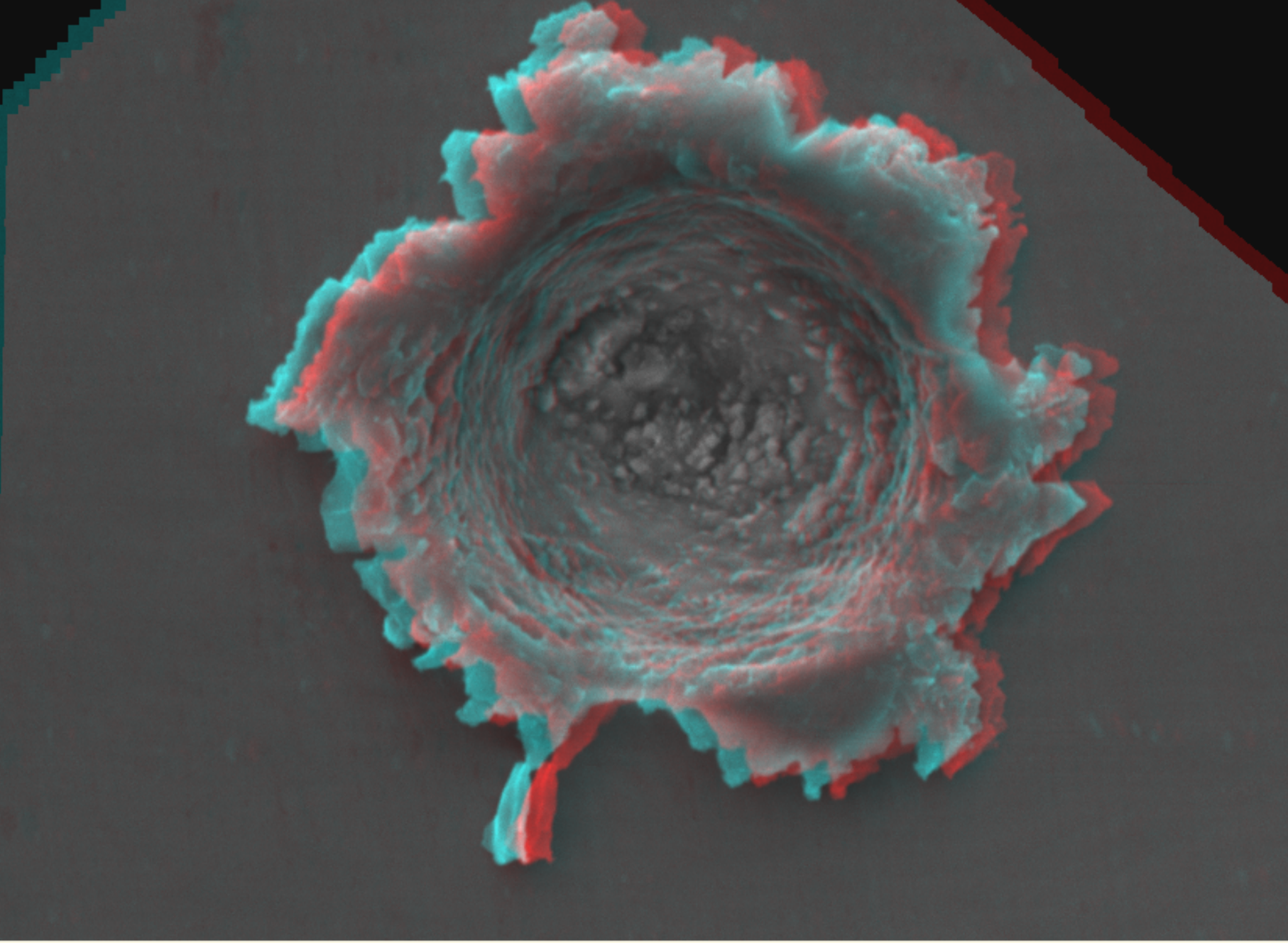
Stardust Foil C2009N,1

A simple, bowl shaped crater of c. 64 microns top lip diameter. Impactor c. 11 microns, 2.5ng? Abundant residue of Mg-rich silicate, low Fe content and variable Cr. Not olivine or pyroxene?

Secondary electron and backscattered electron images. Stereometric anaglyph, depth model and profile. EDS X-ray maps and spectra from inclined crater walls.

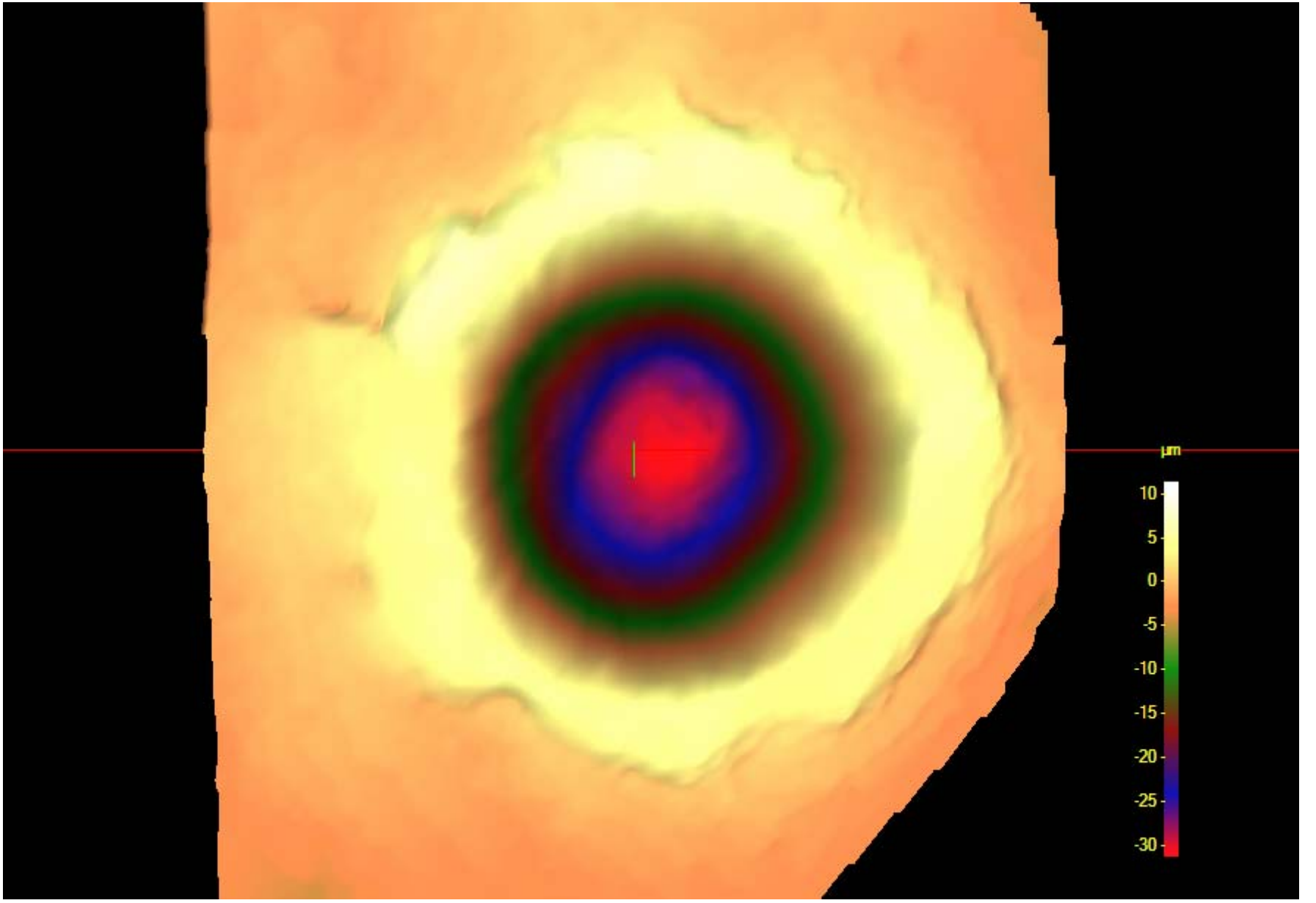
Anton Kearsley NHM, 28th May 2006
Sample given to Rhonda Stroud (NRL) 060503


Stardust foil C2009N1
SEI
60 µm



Stardust foil C2009N,1 depth profile

Stardust foil C2009N,1 depth model



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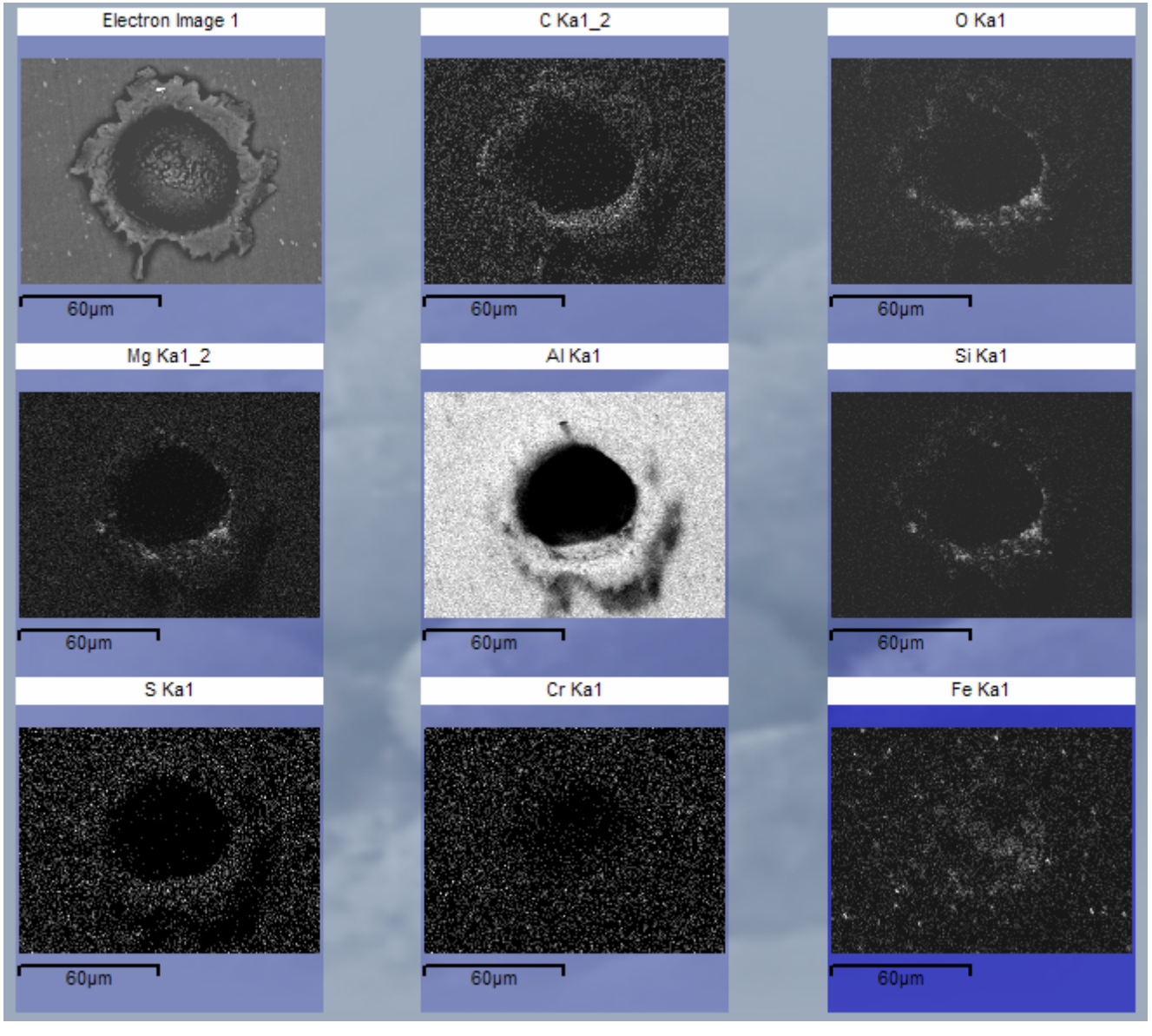

ED X-ray maps reveal patches of Mg-rich silicate around the crater rim and walls, and also probably as a thick layer across much of the crater floor.

The Fe map picks out the residue on the crater floor, and also many small Fe-rich inclusions in the Al alloy, outside the crater.

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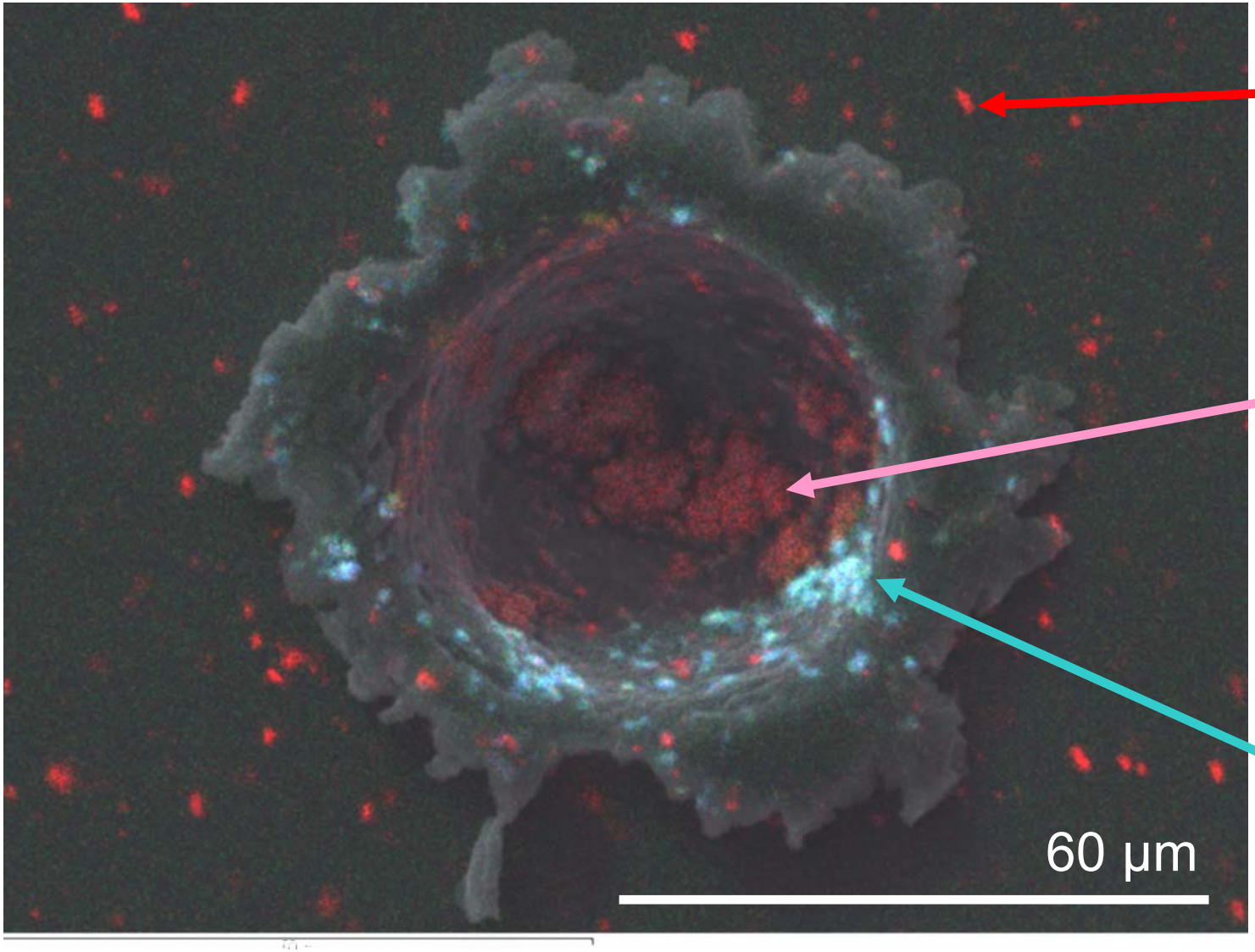
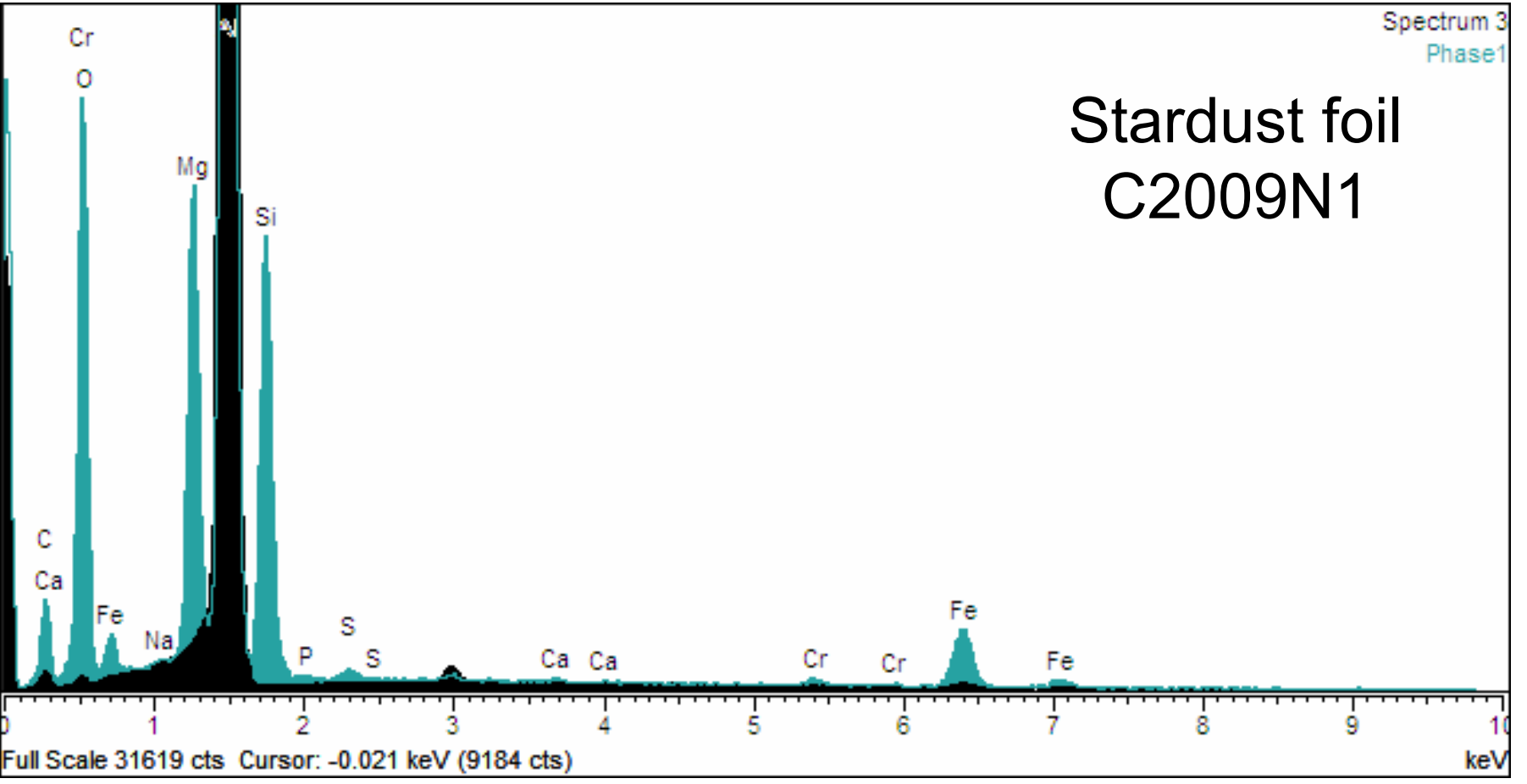
SEI grey, and X-ray maps for:
Mg green Si blue Fe red



Fe-rich inclusions in Al alloy.

Residue on crater floor, Fe Ka seen but Mg and Si not seen due to absorption.

Mg – rich silicate residue on crater wall.



ED spectra show all(?) of the residue is high-Mg silicate with c. 2% Cr + 8% Fe by weight and traces of Na, P and S. Analyses not stoichiometric, probably not Pyroxene or Olivine?

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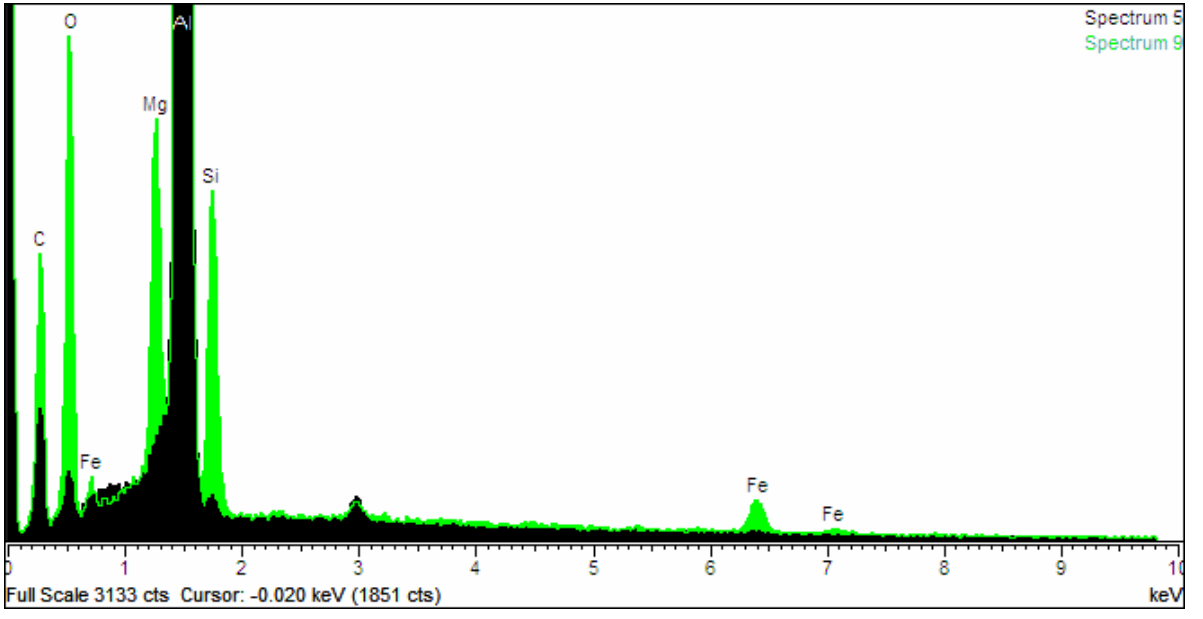
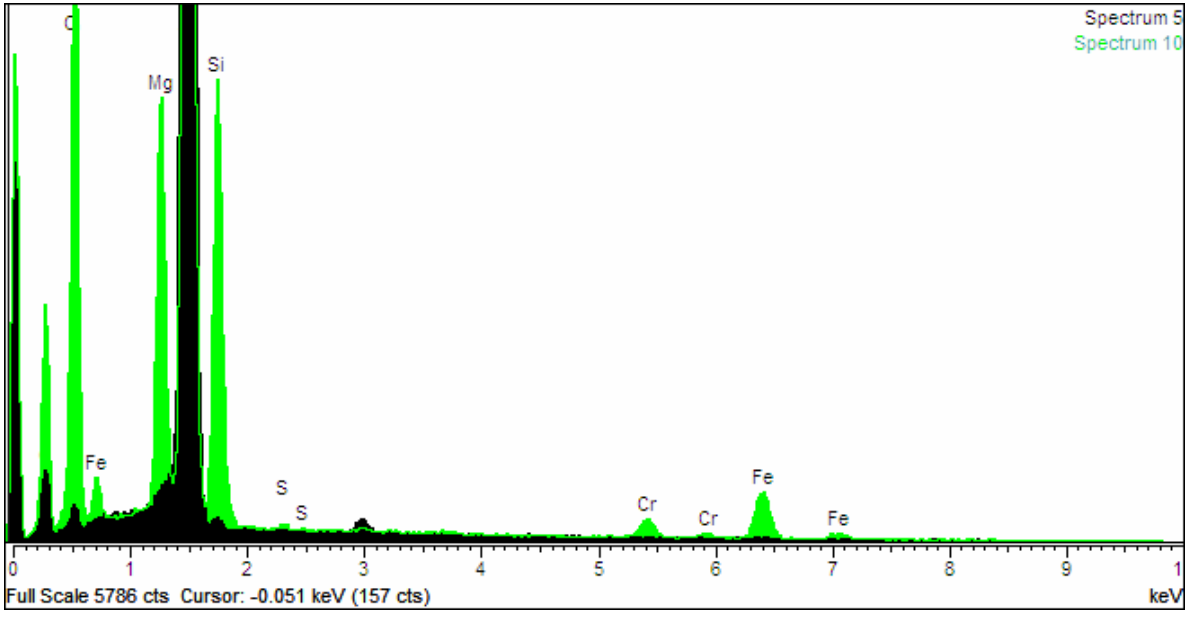
Mg-rich silicate spectra



Spectrum 9, low in Cr



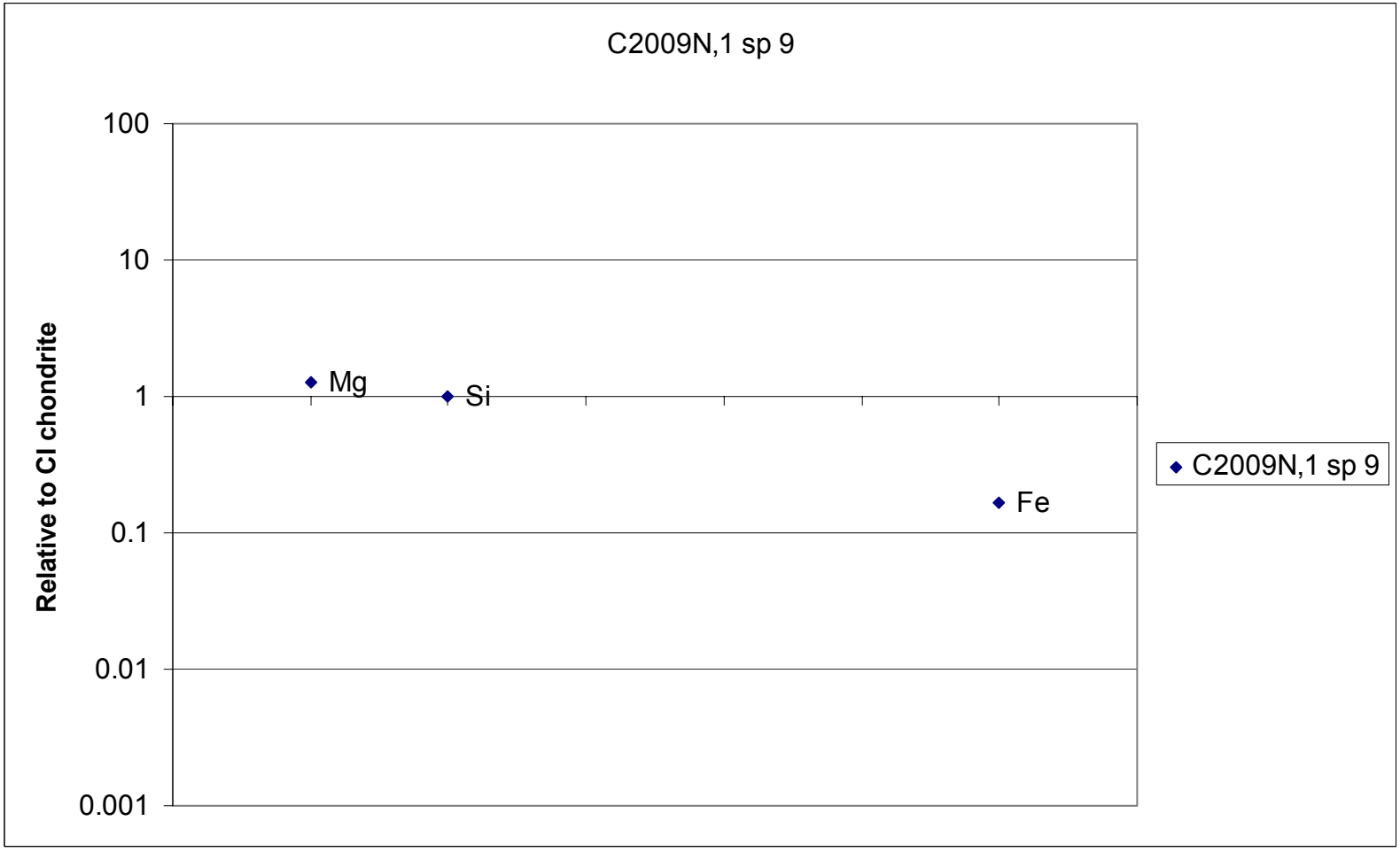
Spectrum 10, high Cr

C2009N,1 ak060427a sp 9 and 10

ED X-ray spectra from residue on inclined crater wall

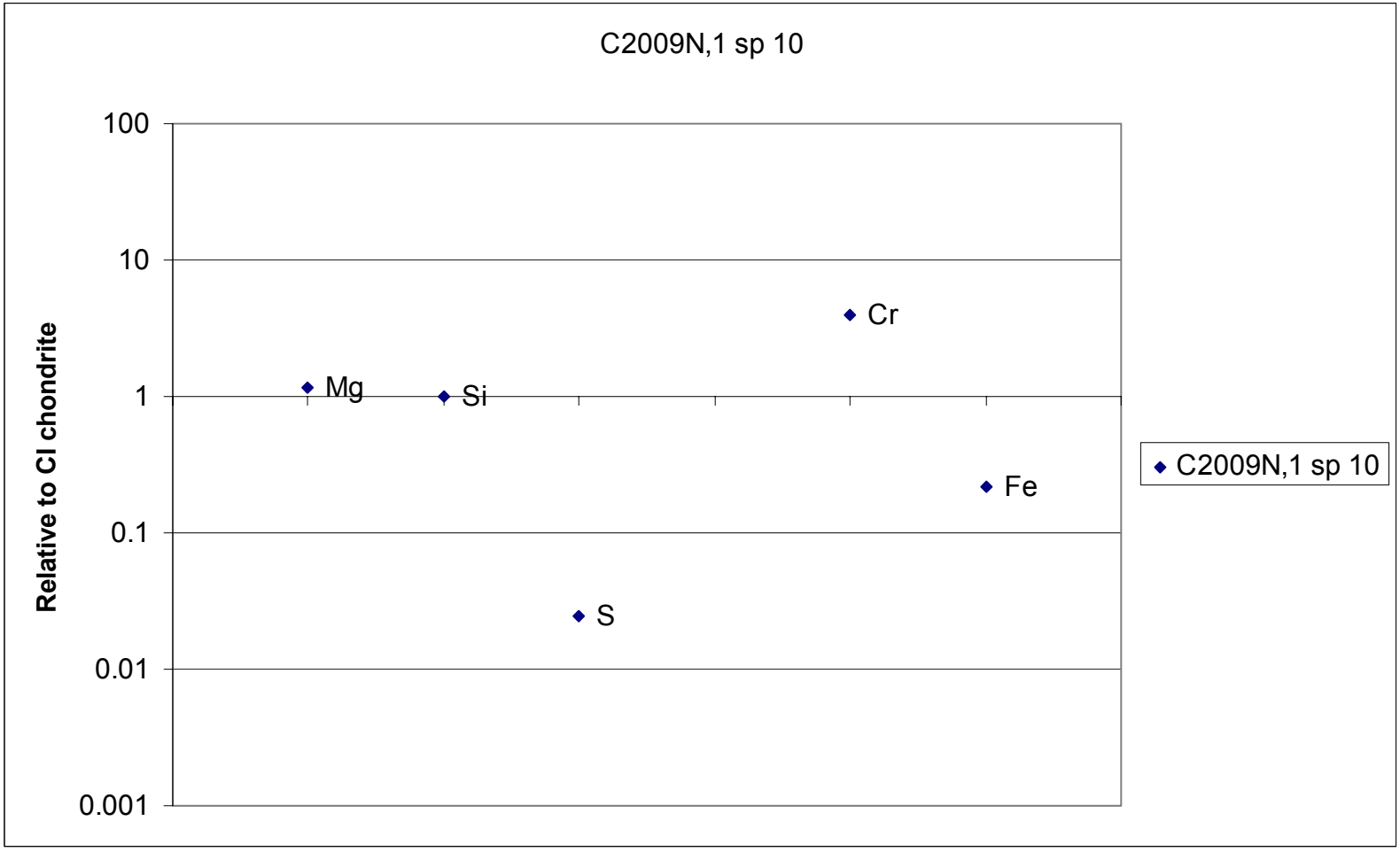
Element	Weight%	Weight% sigma	Atomic%	Number of ions
Mg	25.9	0.3	22.3	9.1
Si	22.7	0.3	16.9	6.9
Fe	6.6	0.3	2.5	1.0
O	44.8	0.4	58.4	24.0
Totals	100.0		cations	17.1

Element	Weight%	Weight% sigma	Atomic%	Number of ions
Mg	22.9	0.2	20.1	8.2
Si	22.2	0.2	16.9	6.9
S	0.3	0.1	0.2	0.1
Cr	2.1	0.1	0.9	0.4
Fe	8.3	0.2	3.2	1.3
O	44.2	0.2	58.8	24.0
Totals	100.0		cations	16.8



Stardust foil C2009N1

Spectrum 9, Cr below detection limit



Stardust foil C2009N1

Spectrum 10, high Cr (2%)