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Supporting information for article:

**Chemical state mapping of simulant Chernobyl lava-like fuel
containing material using micro-focused synchrotron X-ray
spectroscopy**

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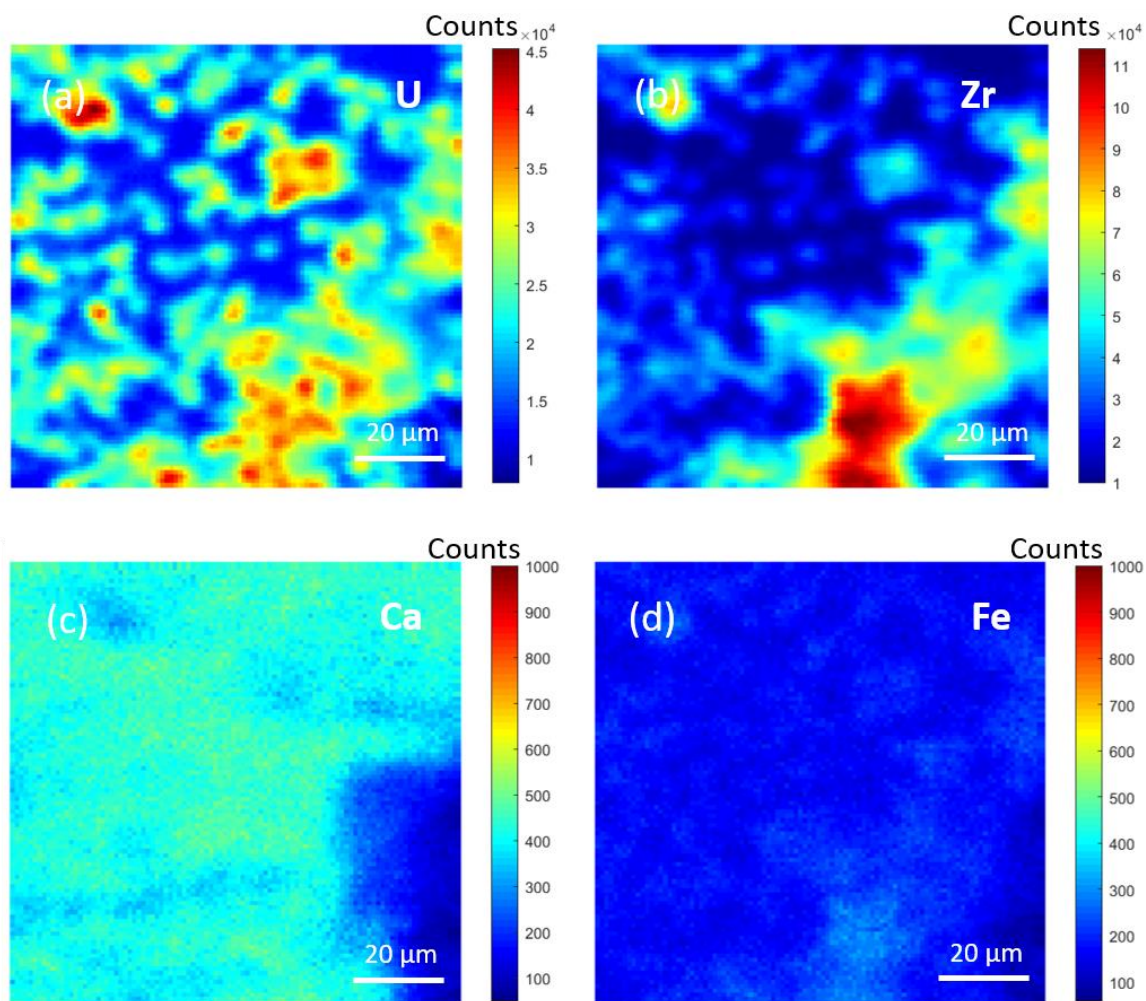


Figure S1 μ -focus fluorescence maps of Brown LFCM at 18,000 eV. Showing distribution of **a)** U L α , **b)** Zr K α , **c)** Ca K α , and **d)** Fe K α fluorescence signals.

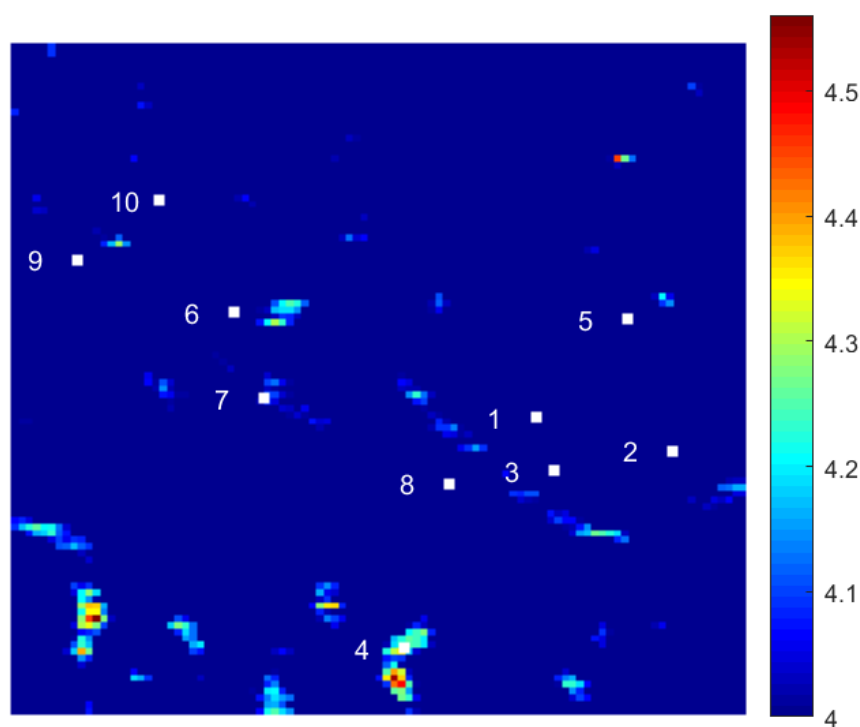


Figure S2 Chemical state mapping of Black LFCM derived from multiple scattering peak regression (MPR) analysis with locations of representative points selected for XANES data acquisition.

Table S1 μ -EXAFS fit parameters of representative points in simulant Black LFCM.

Points	S_0^2	R-factor	N1	U-O(\AA)	$\sigma^2(10^{-2}\text{\AA}^2)$	N2	U-Zr(Si)(\AA)	$\sigma^2(10^{-2}\text{\AA}^2)$	N3	U-U(\AA)	$\sigma^2(10^{-2}\text{\AA}^2)$
A	0.95	0.033	4	2.26	1.04	4	3.21	0.69	4	3.81	1.00
				± 0.11	± 1.43		± 0.04	± 0.57			
			4	2.36	1.04	4	3.61	3.57			
			± 0.13	± 1.43		± 0.20	± 3.82				
B2	0.95	0.032	8	2.33	1.16	3.66	3.83	0.91	8.34	3.83	0.91
				± 0.01	± 0.10	± 0.86	± 0.02	± 0.14	± 0.86	± 0.02	± 0.14
			4.89	2.24	0.31						
C	0.95	0.039	± 1.65	± 0.03	± 0.39	2.59	3.15	0.69			
			2.91	2.42	0.31	± 2.14	± 0.03	± 0.57			
			± 0.70	± 0.05	± 0.39						