

Supplementary Material for

Cesium-rich micro-particles: A window into the meltdown events at the Fukushima Daiichi Nuclear Power Plant

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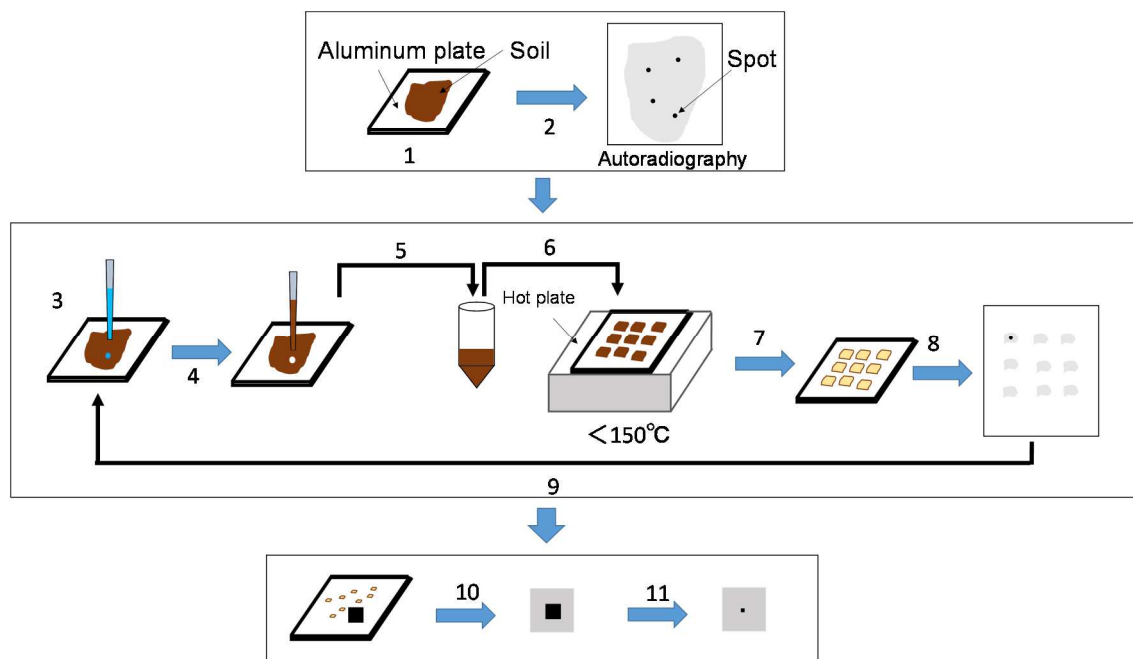


Figure S1. A diagram showing the procedure separating CsMPs from the soil samples.

Table S1. Chemical composition (wt.%) of the area analysis on the FIB thin section of the KOI, OTZ, and AQC CsMPs as determined by STEM-EDX standardless quantification. The analysis was conducted using a rastered STEM probe ($\sim 100 \times 100$ nm) in order to minimize the diffusion of alkaline elements, such as K and Cs, under the electron beam. The composition was calculated as an oxide except for Cl and normalized to 100% in total. Iron concentration is presented as Fe₂O₃.

	SiO ₂	Fe ₂ O ₃	ZnO	Cs ₂ O	SnO ₂	Rb ₂ O	K ₂ O	Cl	MnO	PbO
KOI										
	71.6	11.3	5.63	5.63	4.11	0.40	0.11	0.69	0.34	0.15
	72.2	9.39	4.66	8.00	3.69	0.87	0.37	0.61	0.08	0.17
	76.3	9.34	4.92	4.20	3.49	0.60	0.18	0.48	0.19	0.27
	66.2	10.1	6.30	10.6	3.46	1.55	0.44	0.70	0.24	0.44
	70.4	11.3	6.52	5.66	4.31	0.00	0.46	0.78	0.54	0.00
	67.8	13.3	5.83	6.92	4.61	0.00	0.24	0.70	0.59	0.00
	72.3	11.4	6.97	3.67	3.92	0.00	0.22	0.74	0.82	0.00
	54.3	17.3	12.3	8.50	1.95	2.08	0.95	1.72	0.87	0.01
	68.5	11.5	6.87	6.38	4.29	0.62	0.50	0.73	0.47	0.11
	64.4	10.4	6.22	11.3	4.28	1.32	0.92	0.85	0.31	0.00
	65.0	10.8	5.67	11.4	3.82	1.71	0.37	0.84	0.33	0.01
	64.8	10.7	6.19	10.9	4.35	1.47	0.29	0.59	0.39	0.36
	59.20	12.3	7.12	12.0	4.47	2.47	0.49	0.83	0.46	0.72
	64.1	12.0	6.17	11.2	3.24	1.70	0.39	0.77	0.40	0.01
	53.8	18.6	6.12	11.5	6.38	1.31	0.11	1.02	0.85	0.36
	62.6	12.8	7.53	9.47	4.22	1.23	0.46	0.66	0.59	0.47
	54.5	15.6	6.81	13.7	4.73	2.01	0.48	0.81	0.71	0.68
high KOI										
	61.9	11.8	6.47	11.7	3.74	1.73	0.69	0.80	0.47	0.67
	57.8	11.1	6.55	17.3	3.71	1.42	0.40	0.61	0.43	0.72
	53.7	11.1	6.38	19.2	3.58	3.31	1.20	0.63	0.47	0.35
	53.5	11.9	6.83	18.3	4.46	2.43	1.03	0.61	0.53	0.41

OTZ	55.9	11.9	5.70	15.6	4.02	2.96	1.29	2.08	0.56	0.00
	58.1	11.8	4.88	13.4	3.80	3.19	1.09	3.14	0.40	0.14
	55.8	11.8	4.45	15.7	3.70	2.96	1.27	3.25	0.35	0.80
	63.9	12.2	6.84	9.12	3.68	1.12	0.76	0.85	0.57	0.97
	48.9	20.5	14.3	9.09	2.29	0.00	1.80	2.24	0.85	0.00
	54.3	17.3	12.3	8.50	1.95	2.08	0.95	1.72	0.87	0.01
	46.7	18.1	13.7	11.2	2.8	2.30	2.04	1.91	0.88	0.46
	47.9	16.9	13.2	11.5	2.32	2.34	2.23	1.52	1.01	1.12
	43.6	19.1	15.3	10.6	2.27	2.26	2.45	1.95	1.05	1.44
	47.1	17.8	13.8	11.1	2.85	2.07	1.69	1.6	0.84	1.11
AQC	43.4	19.5	14.3	12.9	2.95	2.36	1.70	1.48	0.84	0.53
	42.5	19.7	15.1	11.9	2.16	2.53	2.41	1.75	0.99	0.98
	42.2	19.6	15.0	12.9	2.57	2.74	1.93	1.61	1.06	0.43
	42.0	19.3	15.0	12.5	3.15	2.80	1.75	1.58	1.04	1.01
	40.8	20.7	15.6	11.9	2.43	2.75	2.45	1.73	1.12	0.61
	80.8	6.08	5.34	1.71	3.31	0.00	2.38	0.33	0.08	0.00
	82.7	6.36	4.82	1.42	3.30	0.00	1.04	0.41	0.00	0.00
	81.5	7.08	5.08	1.12	3.66	0.00	1.24	0.37	0.00	0.00
	81.0	6.36	5.48	1.37	3.23	0.00	2.01	0.38	0.21	0.00
	79.7	6.61	5.80	1.87	3.33	0.00	2.06	0.37	0.26	0.00
	81.6	6.37	5.76	1.36	3.09	0.00	1.11	0.41	0.35	0.00
	82.1	6.28	6.08	1.34	2.58	0.00	0.90	0.43	0.27	0.00

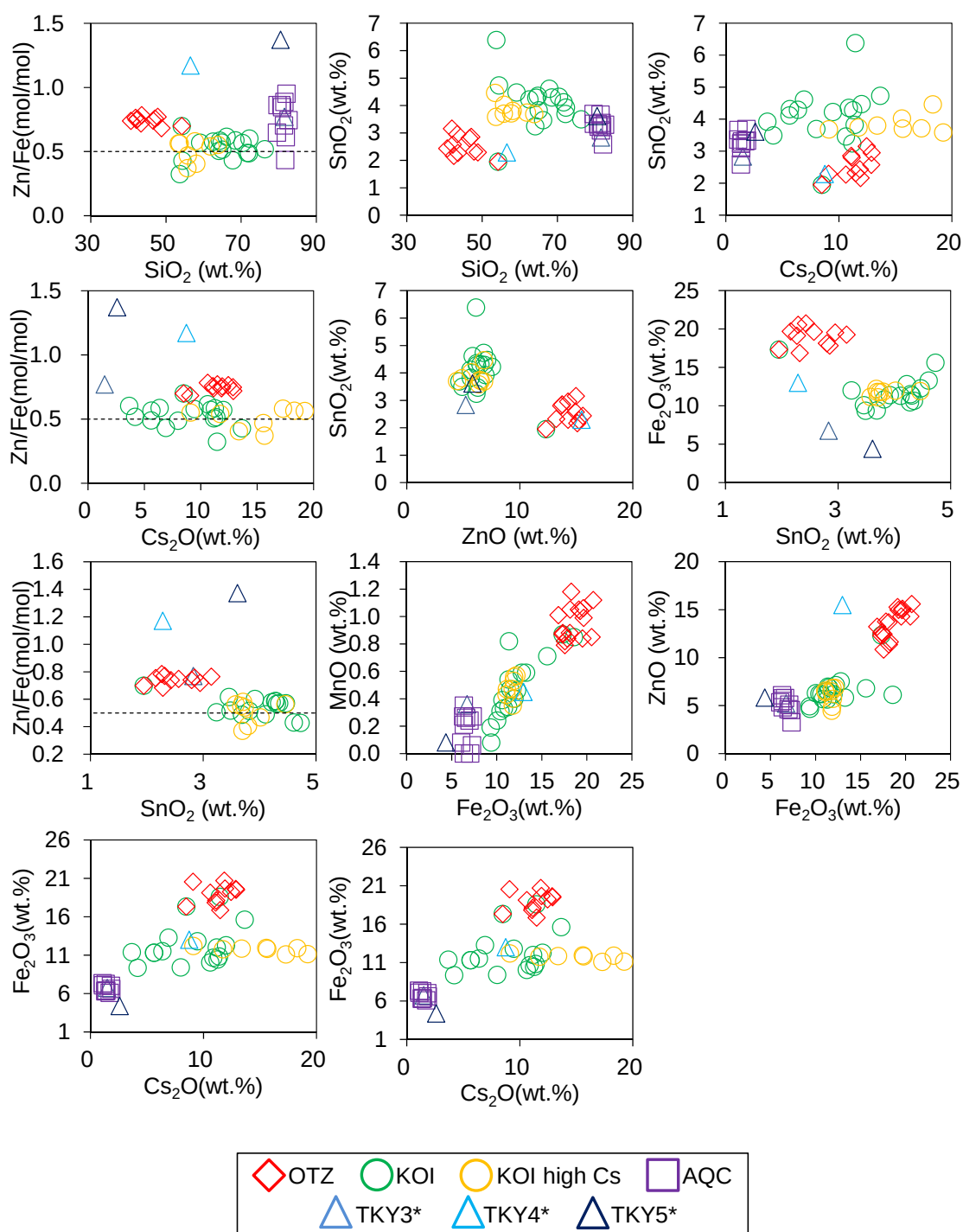


Figure S2. Diagrams showing the correlation between the constituent elements of the CsMPs based on the STEM-EDX area analysis (wt.%). *The TKY data are from Imoto *et al.* (2017)²⁰.

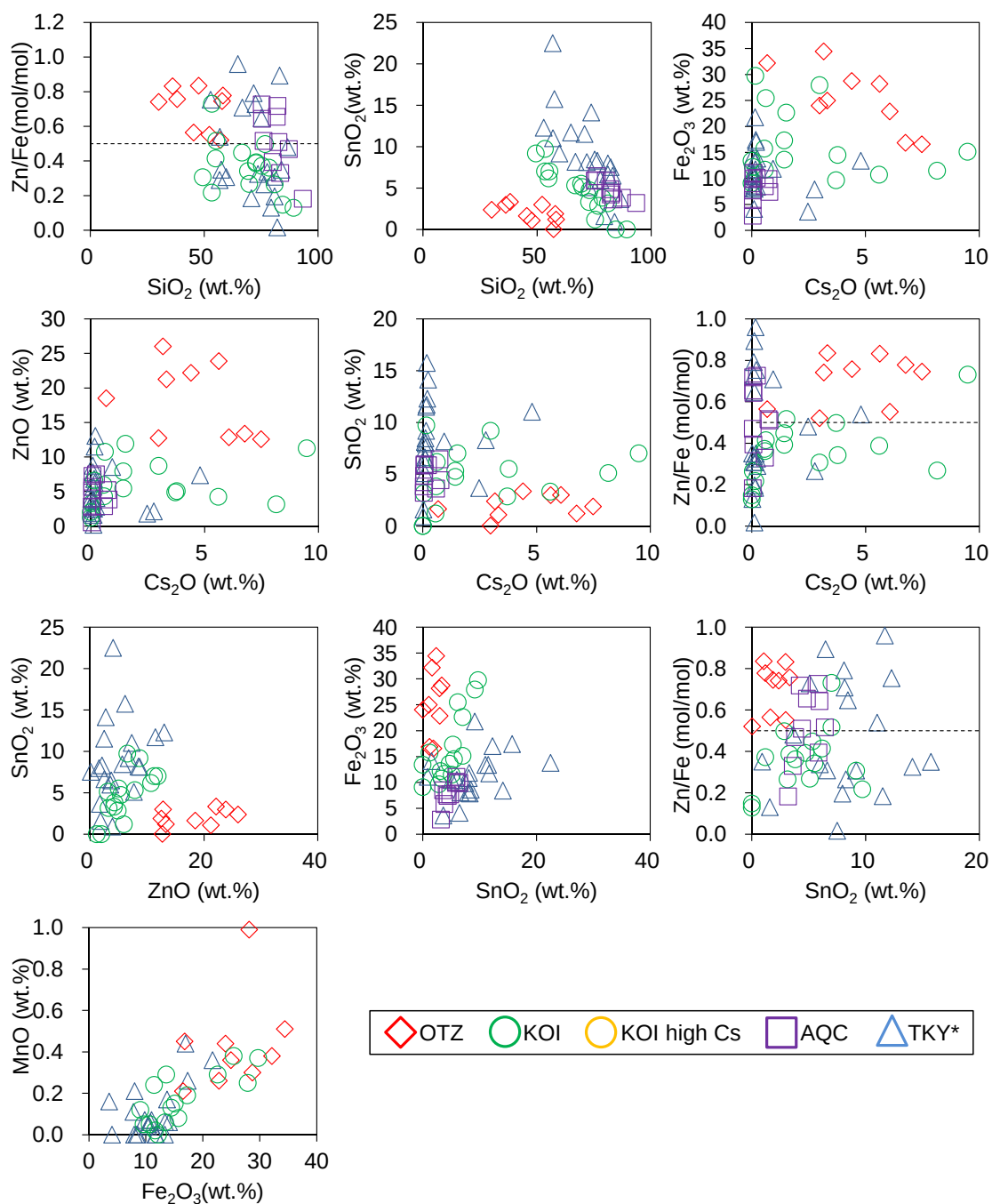


Figure S3. Diagrams showing the correlation between the constituent elements of the CsMPs based on the STEM-EDX point analysis (wt.%). * The TKY data from Imoto *et al.* (2017)²⁰.