

Supplementary Information for

**Isotopic signature and nano-texture of cesium-rich micro-particles: Release of uranium and fission products from the Fukushima Daiichi Nuclear Power Plant**

**Junpei Imoto <sup>1,\*\*</sup>, Asumi Ochiai <sup>1,\*\*</sup>, Genki Furuki <sup>1</sup>, Mizuki Suetake <sup>1</sup>, Ryohei Ikehara <sup>1</sup>, Kenji Horie <sup>2,3</sup>, Mami Takehara <sup>2</sup>, Shinya Yamasaki <sup>4</sup>, Kenji Nanba <sup>5</sup>, Toshihiko Ohnuki <sup>6</sup>, Gareth T. W. Law<sup>7</sup>, Bernd Grambow <sup>8</sup>, Rodney C. Ewing <sup>9</sup>,  
and Satoshi Utsunomiya <sup>1\*</sup>**

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Table S1. Chemical composition of the OTZ3-1 and OTZ10 CsMPs determined by STEM-EDX area analysis.

	SiO <sub>2</sub>	Cs <sub>2</sub> O	Fe <sub>2</sub> O <sub>3</sub>	ZnO	Rb <sub>2</sub> O	K <sub>2</sub> O	SnO <sub>2</sub>	PbO	MnO	Cl
OTZ3-1										
<i>High Cs zone</i>										
Area1	48.0	29.6	9.15	3.56	3.79	0.37	5.10	0.02	0.32	0.07
Area2	51.1	28.9	9.68	3.64	0.68	0.31	5.26	0.03	0.30	0.08
Area3	58.0	19.2	10.4	4.25	1.71	0.25	5.34	0.02	0.59	0.21
Area4	59.5	16.8	10.3	4.36	2.16	0.28	5.92	0.02	0.43	0.27
Area5	62.6	13.7	10.3	4.03	1.76	0.14	6.87	0.01	0.53	0.07
Area6	59.6	29.9	8.16	0.02	0.85	0.20	0.19	1.01	0.04	0.02
Area7	62.6	15.3	11.3	7.01	1.66	0.16	1.19	0.50	0.18	0.06
<i>Low Cs zone</i>										
Area8	69.5	7.09	9.40	5.14	1.23	0.26	6.02	0.36	0.44	0.59
Area9	72.7	6.01	7.85	4.86	1.04	0.34	5.67	0.40	0.48	0.64
Area10	77.3	4.80	6.97	5.66	0.74	0.19	3.03	0.38	0.37	0.55
Area11	74.2	5.42	8.05	4.65	0.99	0.24	5.02	0.26	0.53	0.62
OTZ10										
Area1	57.1	8.18	16.2	11.7	1.82	1.09	1.74	0.02	0.76	1.42
Area2	55.4	7.79	16.5	11.9	2.01	1.50	2.37	0.26	0.81	1.52
Area3	54.3	7.16	18.2	13.2	1.61	1.71	1.44	0.34	0.50	1.55
Area4	55.7	9.92	15.5	11.7	1.42	1.37	1.68	0.63	0.69	1.43
Area5	54.1	8.16	17.0	13.0	0.90	1.57	1.69	1.21	0.86	1.51
Area6	59.9	7.64	16.4	10.9	0.43	0.84	1.88	0.01	0.69	1.30
Area7	61.6	7.17	15.7	9.79	1.09	0.63	1.92	0.17	0.54	1.36
Area8	56.1	7.77	16.4	11.8	1.81	1.51	1.21	1.09	0.78	1.50
Area9	54.1	7.19	17.6	12.0	1.72	1.74	2.30	1.10	0.8	1.46
Area10	55.4	6.88	17.2	12.8	1.79	1.53	1.41	0.71	0.59	1.65
Area11	56.8	8.65	16.1	11.9	1.26	1.22	1.45	0.68	0.51	1.50

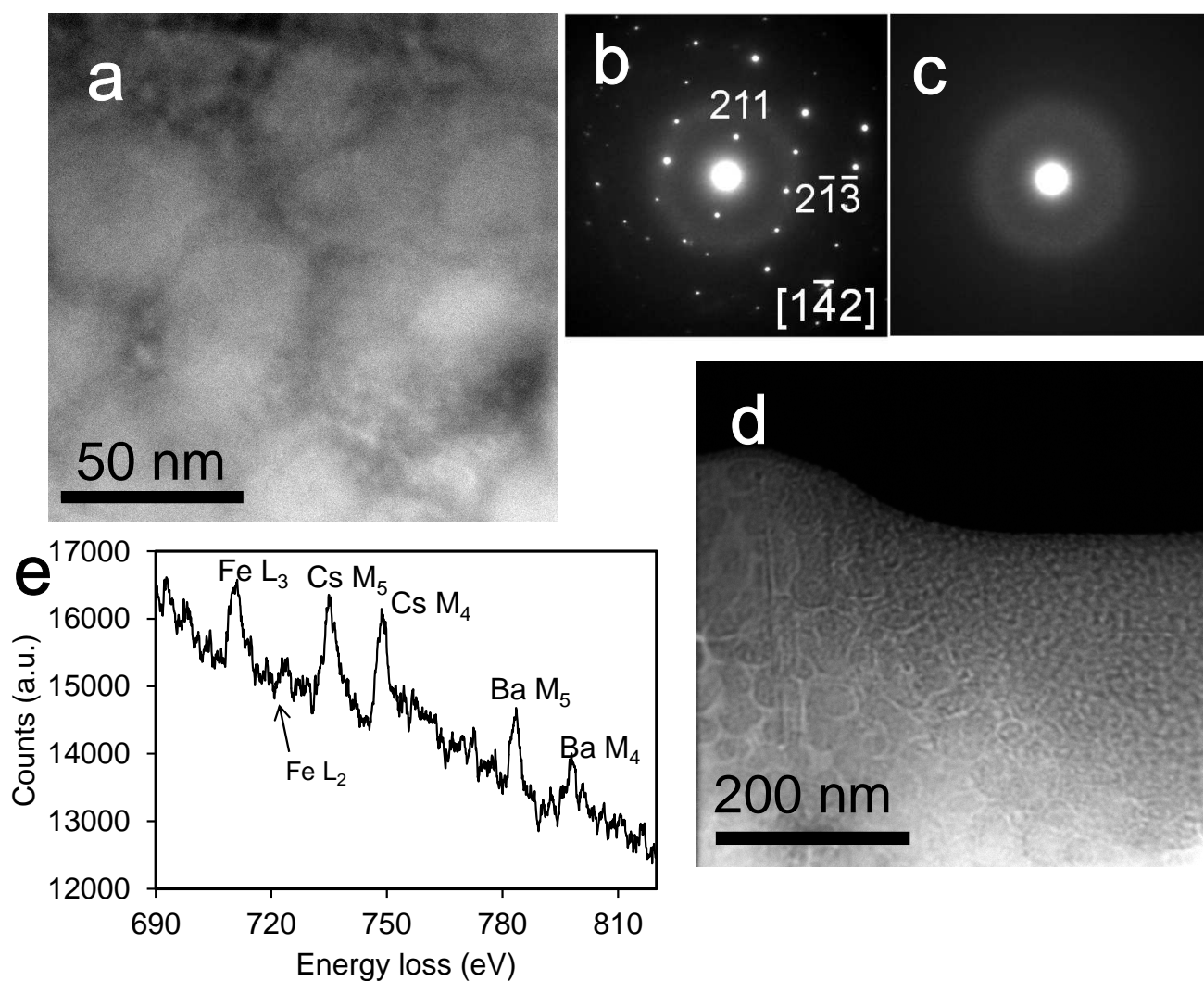


Figure S1. (a) HAADF-STEM image of the high Cs zone (represented by edx2 in Fig. 3b) in OTZ3-1 CsMP. (b) A SAED pattern of a large nanoparticle with high Cs content before amorphization by electron-beam irradiation. (c) A SAED pattern of a large nanoparticle with high Cs content after amorphization by electron-beam irradiation. (d) HAADF-STEM image of the boundary between high and low Cs zones (Fig. 3b) after amorphization by electron-beam irradiation. (e) Electron energy-loss spectroscopy of a high Cs zone.

Figure S1

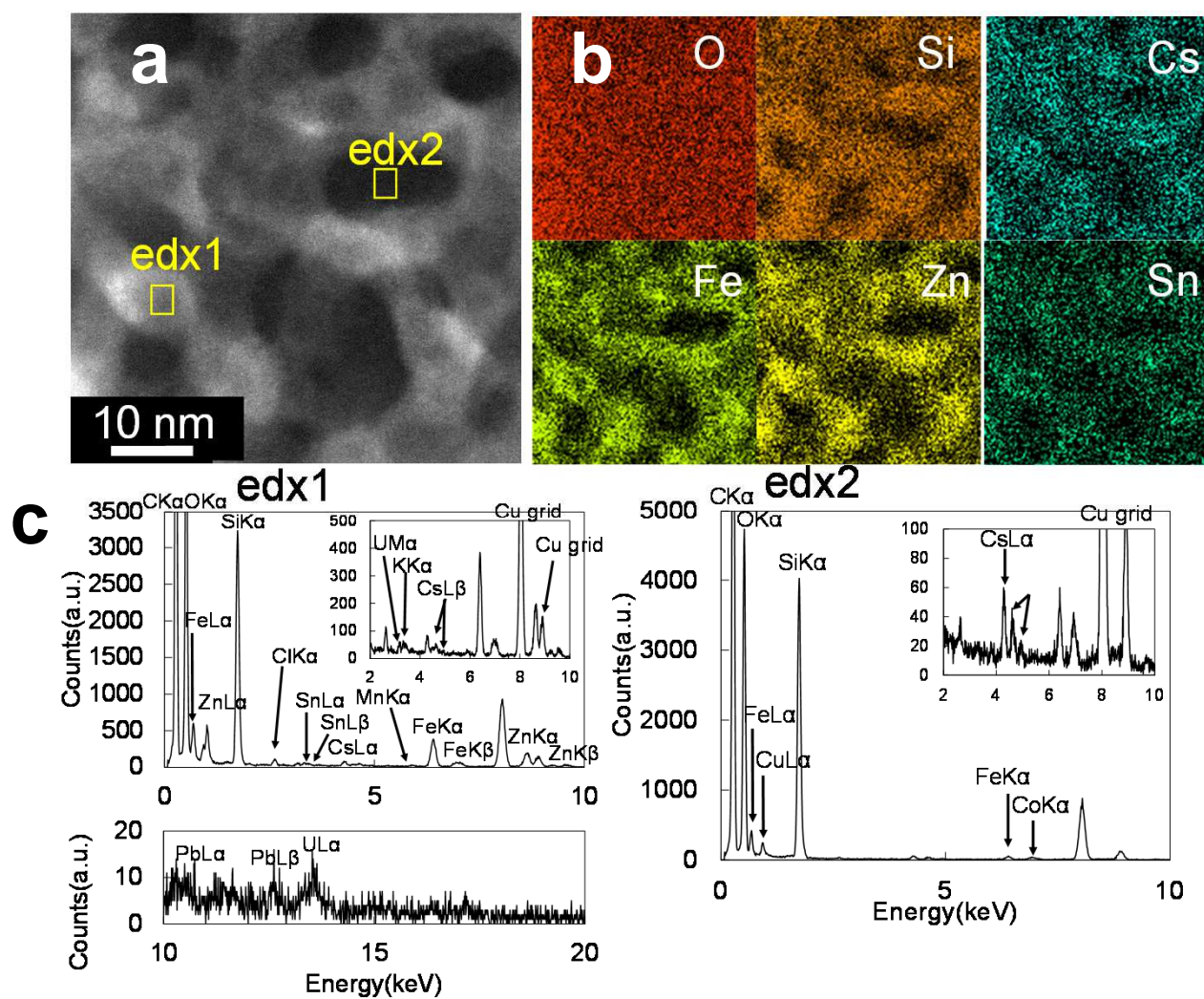


Figure S2. (a) HAADF-STEM image the OTZ10 CsMP. (b) Elemental maps of the major constituents for (a). (c) EDX spectra of the portion indicated by edx1 and edx2 in (a).

Figure S2