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First measurements of the Fe oxidation state of spinel inclusions in olivine single crystals from Vulture (Italy) with the in situ synchrotron micro-Mössbauer technique

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Table S1 Literature chemical composition for Vulture olivines in wehrlitic lapilli, loose xenocrystals and wehrlitic xenoliths.

References	Sample	Comment	SiO_2	FeO_{tot}	MnO	MgO	CaO	Cr_2O_3	NiO	Tot.	Mg#	Fo	Fa
Carnevale et al. (2022)	ol-lap1	core	41.70	8.97	0.14	49.60	0.09	0.03	0.38	100.95	0.91	90.8	9.21
Carnevale et al. (2022)	ol-lap2	core	41.70	9.15	0.14	49.80	0.09	0.03	0.37	101.27	0.91	90.7	9.35
Carnevale et al. (2022)	ol-lap3	core	42.00	9.02	0.14	49.70	0.08	0.03	0.38	101.28	0.91	90.8	9.25
Carnevale et al. (2022)	ol-lap4	core	42.00	8.97	0.14	49.70	0.09	0.03	0.37	101.35	0.91	90.8	9.19
Carnevale et al. (2022)	ol-lap5	core	40.80	9.03	0.13	50.10	0.09	0.03	0.39	100.52	0.91	90.8	9.18
Carnevale et al. (2022)	ol-lap6	core	40.70	10.07	0.16	50.80	0.10	0.03	0.35	102.16	0.90	90.0	10.0
Carnevale et al. (2022)	ol-lap7	core	40.20	9.00	0.14	51.50	0.09	0.03	0.37	101.33	0.91	91.1	8.93
Carnevale et al. (2022)	ol-xeno1	loose	40.50	9.36	0.14	49.90	0.15	0.03	0.38	100.43	0.90	90.5	9.52
Carnevale et al. (2022)	ol-xeno2	loose	39.70	10.35	0.15	49.00	0.14	0.02	0.37	99.64	0.89	89.4	10.6
Carnevale et al. (2022)	ol-xeno3	loose	40.60	8.11	0.11	50.80	0.19	0.04	0.41	100.16	0.92	91.8	8.22
Carnevale et al. (2022)	ol-xeno4	loose	41.50	9.66	0.13	50.70	0.18	0.02	0.37	102.59	0.9	90.4	9.65
Carnevale et al. (2022)	ol-xeno5	loose	40.10	9.06	0.12	49.80	0.12	0.04	0.4	99.66	0.91	90.8	9.25
Carnevale et al. (2022)	ol-xeno6	loose	41.70	8.49	0.11	49.60	0.18	0.03	0.39	100.48	0.91	91.2	8.76
Carnevale et al. (2022)	ol-xeno7	loose	41.00	10.11	0.14	50.30	0.14	0.02	0.37	102.07	0.90	89.9	10.1
Jones et al. (2000)	aj24	xenolith	40.40	9.94	0.16	48.80	0.13	0.08	0.33	99.83	0.90	89.7	10.3
Jones et al. (2000)	aj34	xenolith	40.70	9.31	0.15	49.40	0.13	0.04	0.28	100.02	0.90	89.8	10.2

Table S2 Literature chemical composition for Vulture spinels from wehrlitic xenoliths.

References	Sample	SiO_2	NiO	MgO	CaO	FeO	Al_2O_3	TiO_2	MnO	Cr_2O_3	Na_2O	K_2O	Total	Cr#	Mg#
Jones et al. (2000)	aj7	0.09	0.23	18.82	0.06	13.42	34.43	0.43	0.21	31.86	0.02	0.01	99.58	0.38	0.8
Jones et al. (2000)	aj8	0.06	0.07	14.32	0.01	24.42	27.07	1.12	0.25	31.91	-	0.01	99.24	0.44	0.63
Jones et al. (2000)	aj23	0.06	0.27	18.02	0.01	13.6	37.09	0.17	0.15	30.46	0.01	0.02	99.86	0.39	0.76
Jones et al. (2000)	aj34	0.05	0.31	17.78	0.11	15.64	34	0.55	0.19	31.1	0.02	0.01	99.76	0.38	0.77
Stoppa and Principe (1997)	MLF	0.18	-	17.4	-	17.06	27.9	0.61	0.32	32.8	-	-	96.27	0.44	0.66

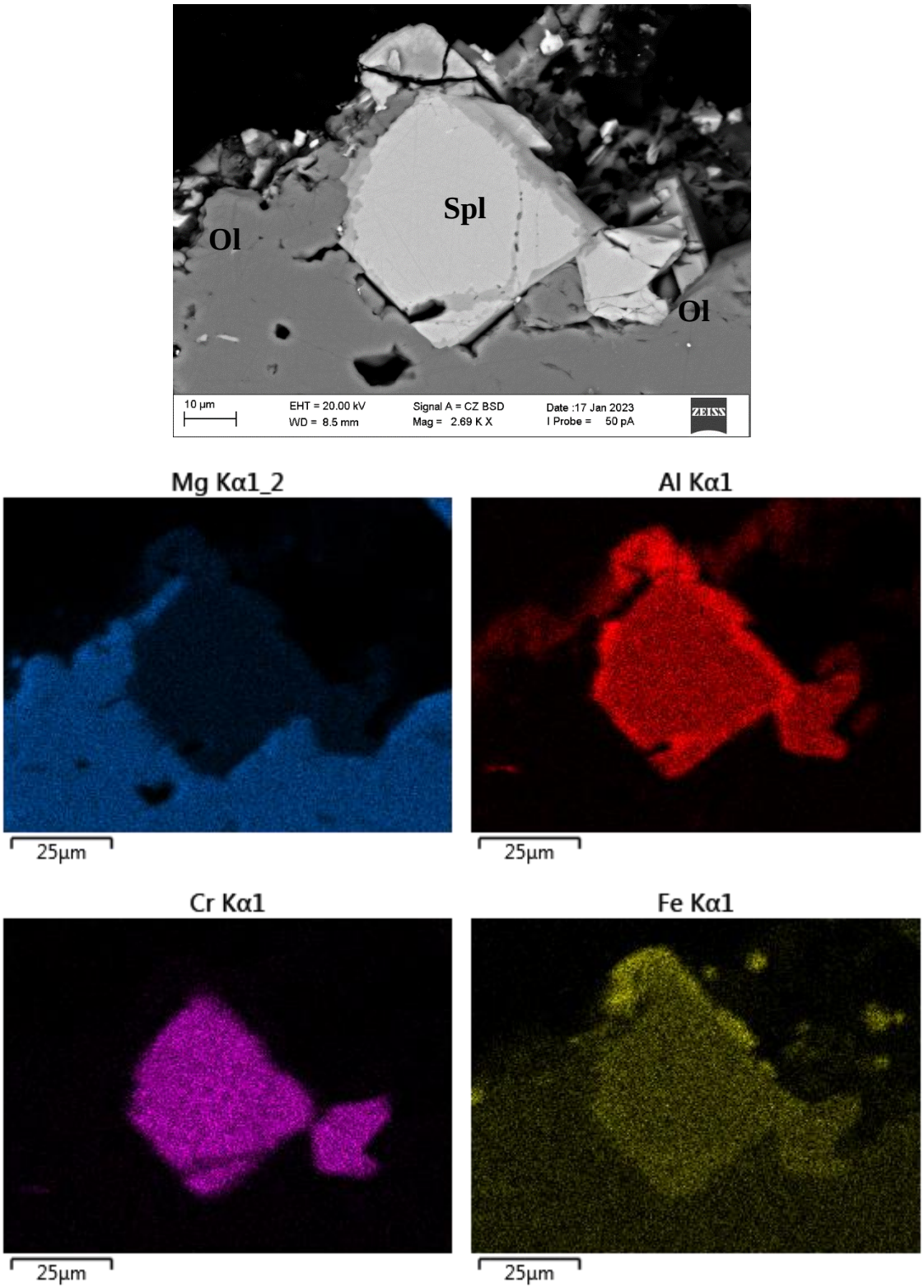
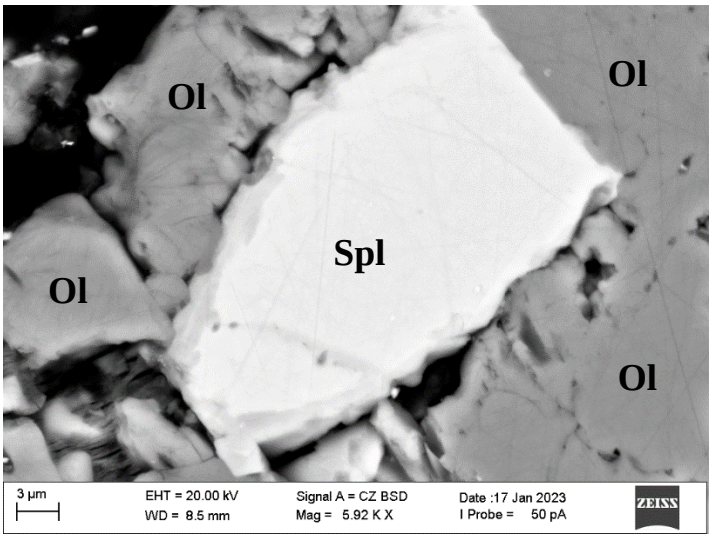


Figure S1 Semi-quantitative chemical map of Spinel_5 hosted in Olivine Vul_2.



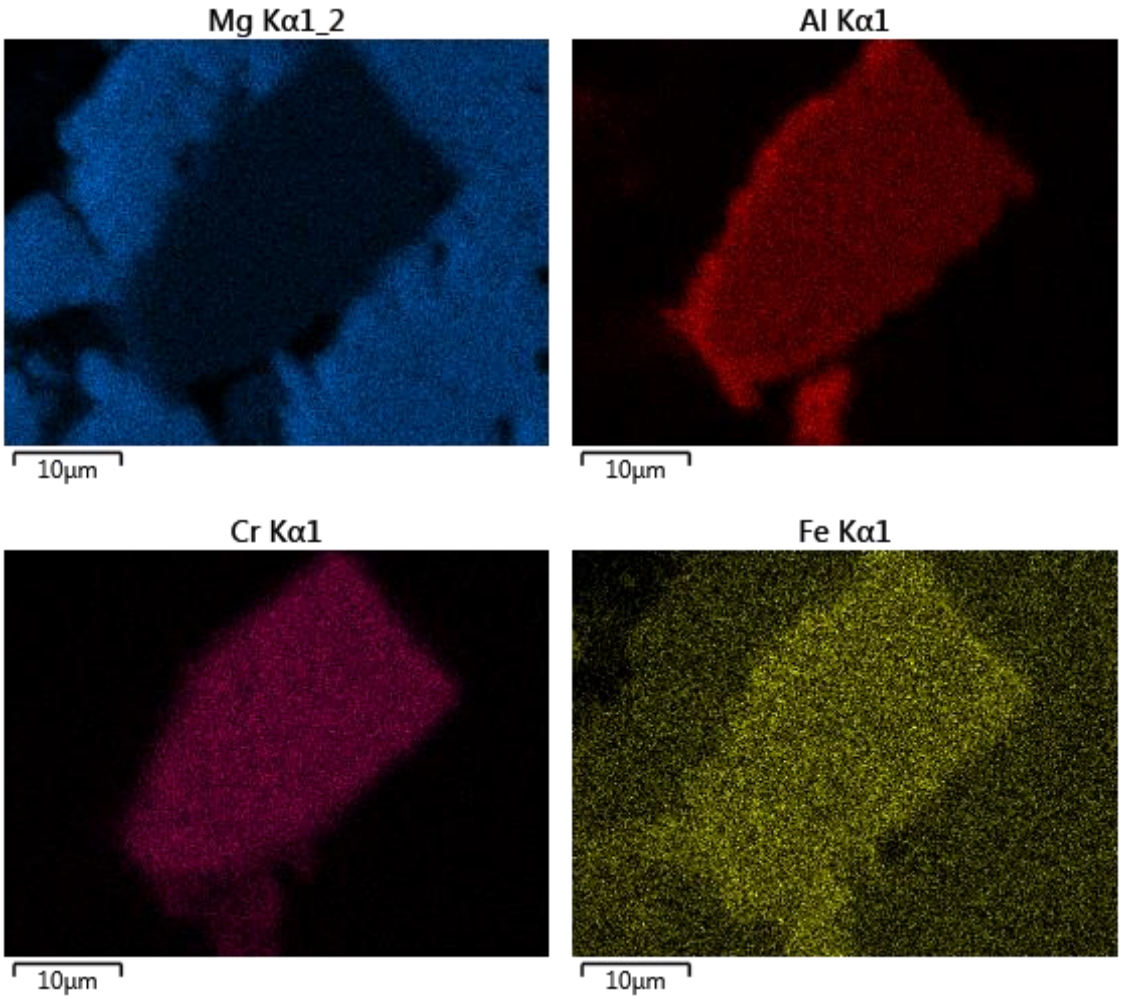


Figure S2 Semi-quantitative chemical map of Spinel_6 hosted in Olivine Vul_2.

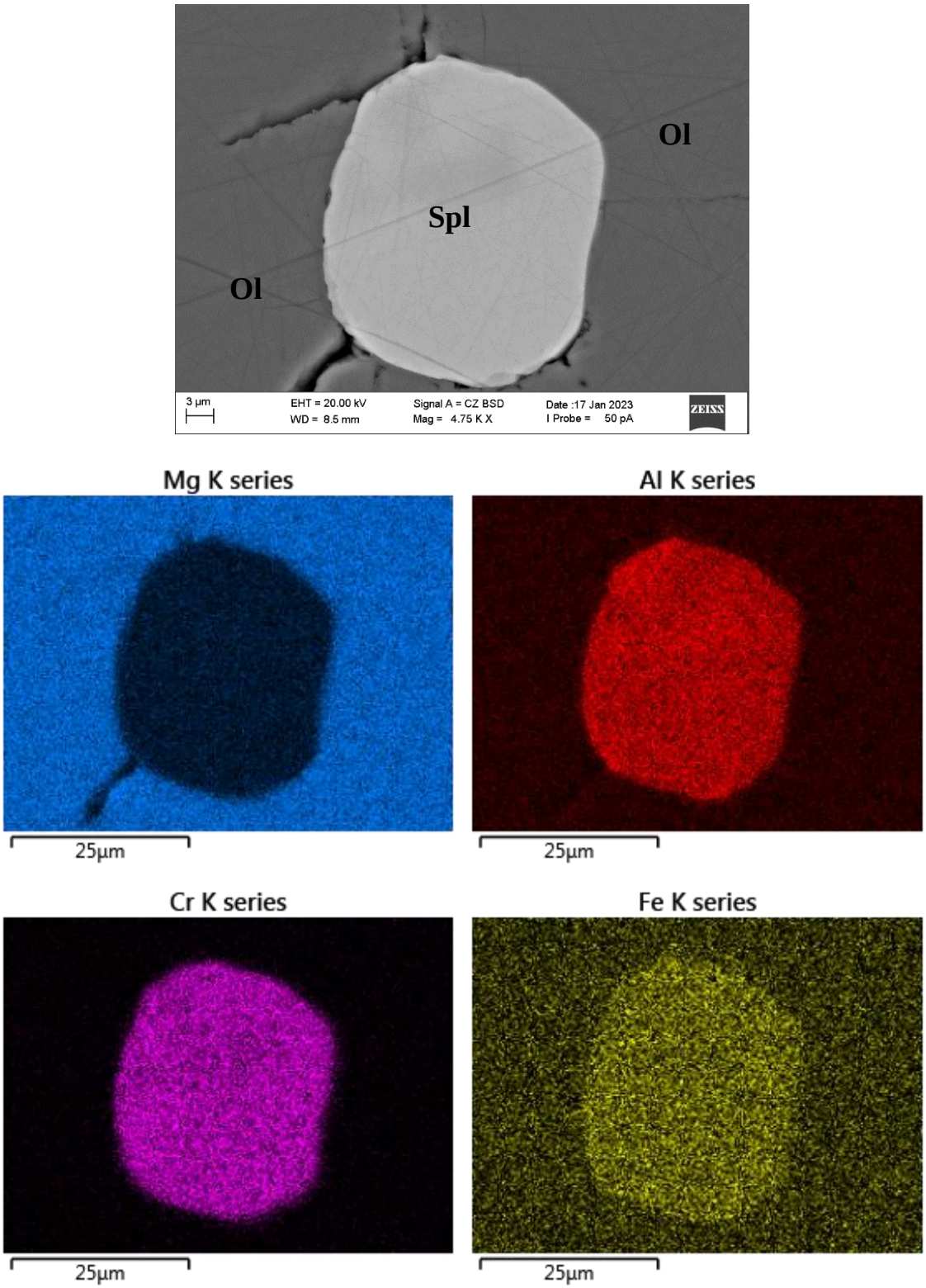


Figure S3 Semi-quantitative chemical map of Spinel_6 hosted in Olivine Vul_ 3.

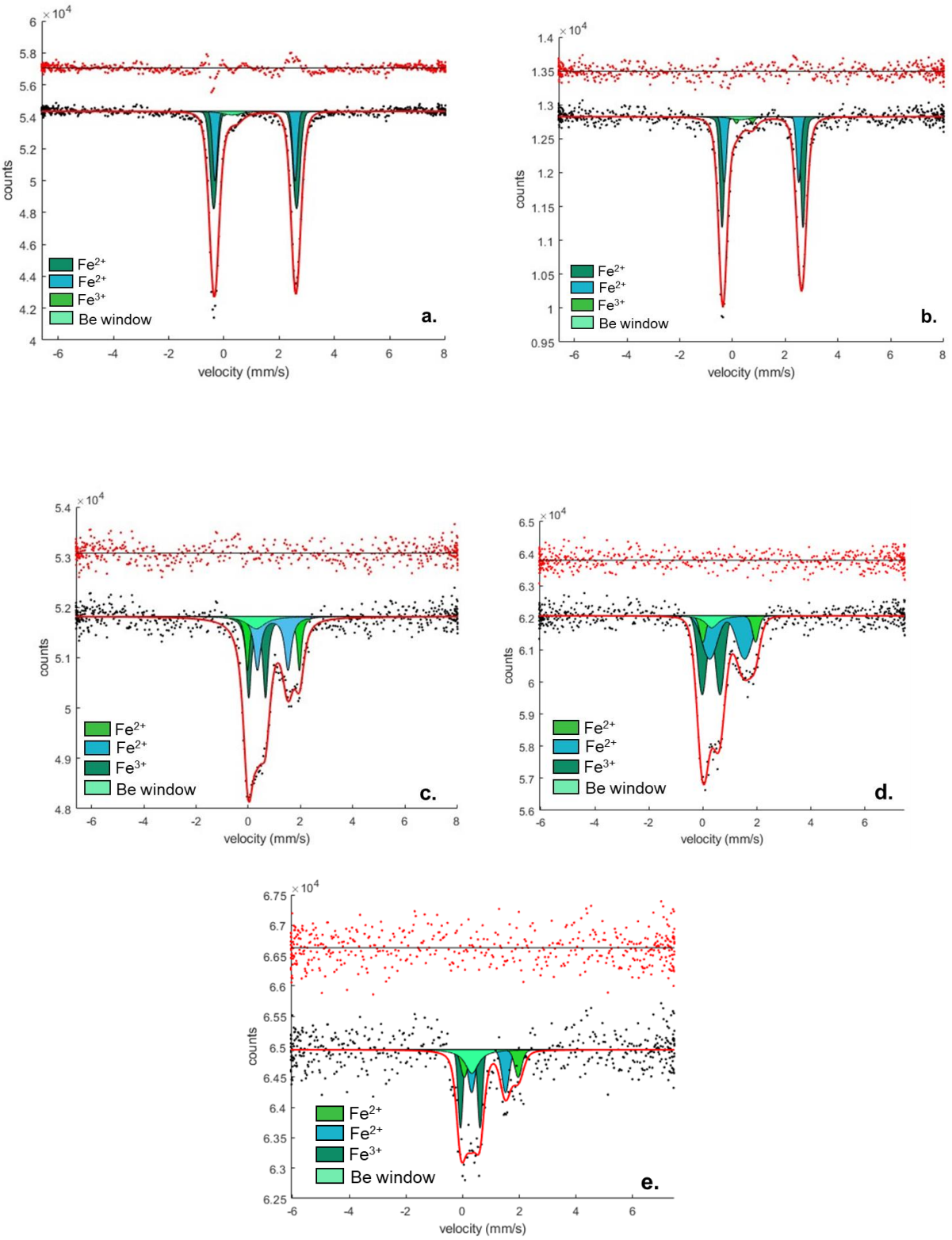


Figure S4 SMS spectra for Olivine Vul_1a, panel a; Olivine Vul_1c, panel b; Spinel_2, panel c, Spinel_5, panel d; Spinel_6, panel e.