Supplementary Materials: Solvent-Free Microwave-Induced Oxidation of Alcohols Catalyzed by Ferrite Magnetic Nanoparticles

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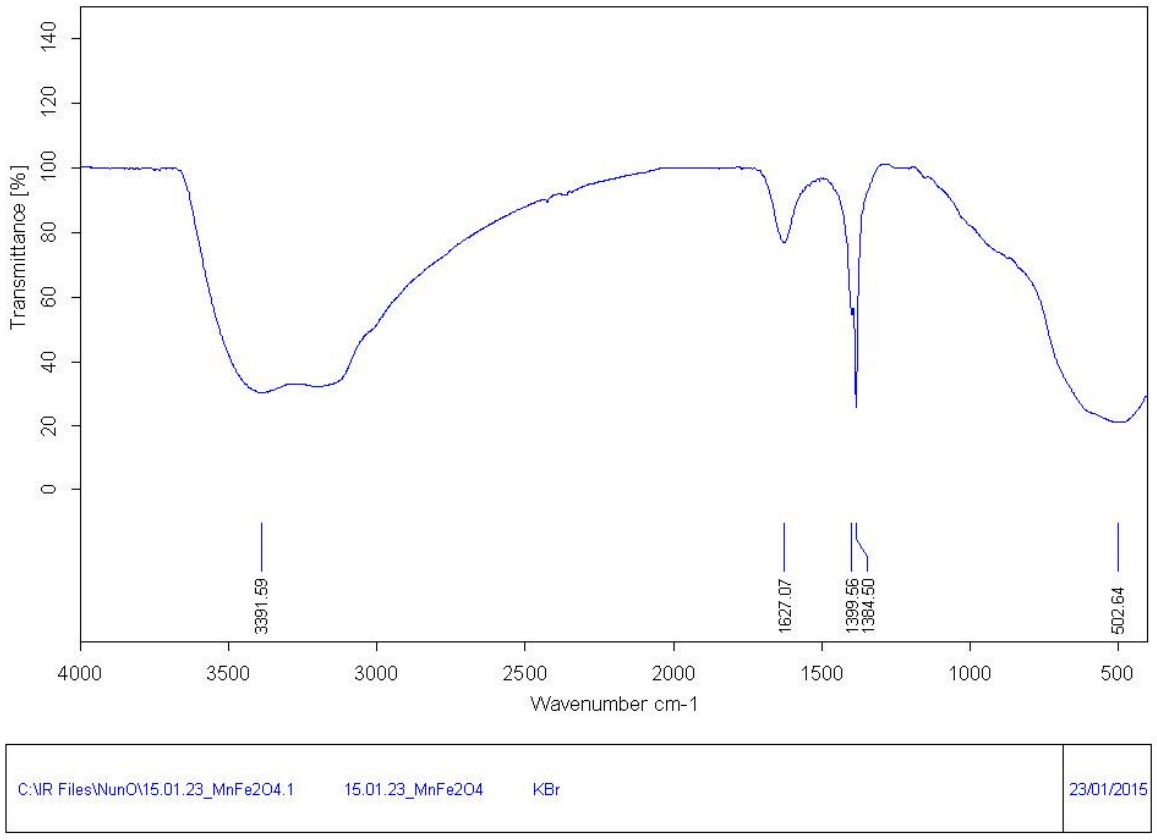


Figure S1.1. FT-IR spectrum of $MnFe_2O_4$ (**1**) in the range of 4000-400 cm^{-1}.

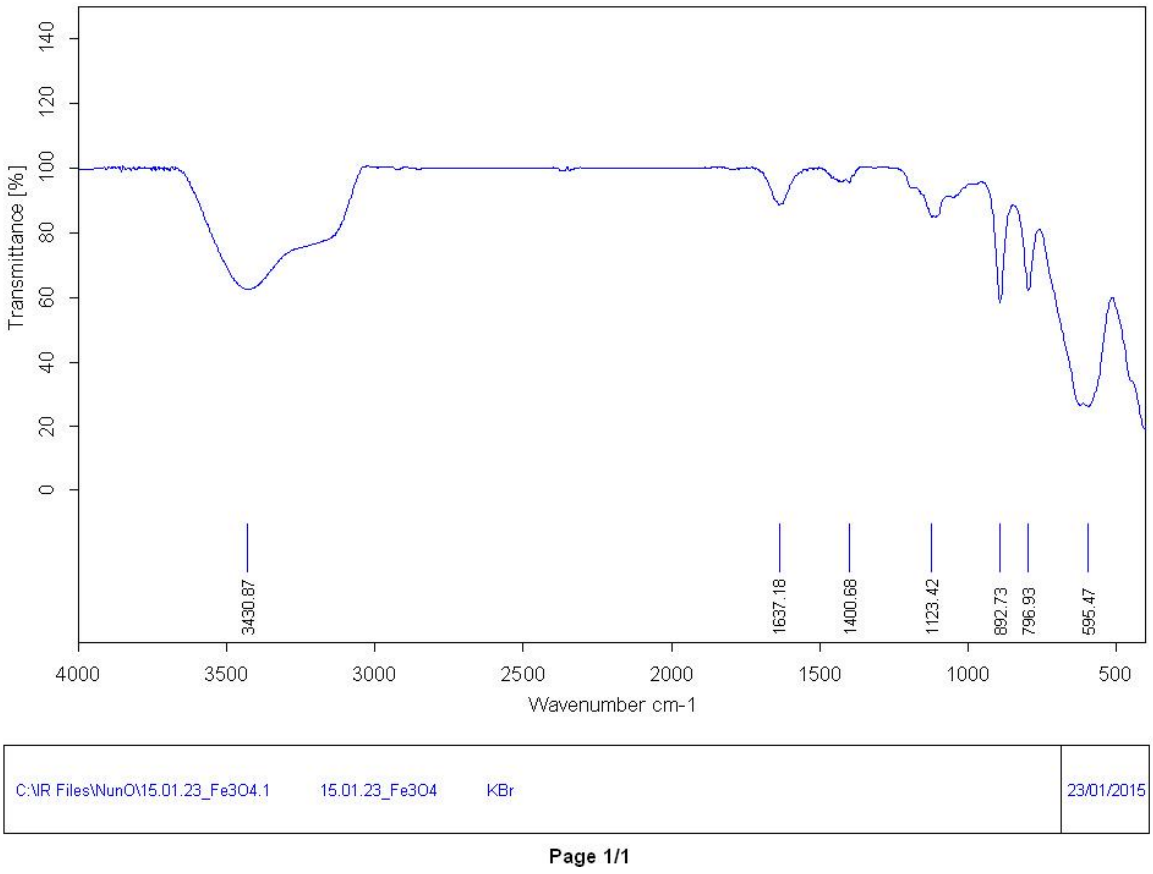


Figure S1.2. FT-IR spectrum of Fe_3O_4 (**2**) in the range of 4000-400 cm^{-1}.

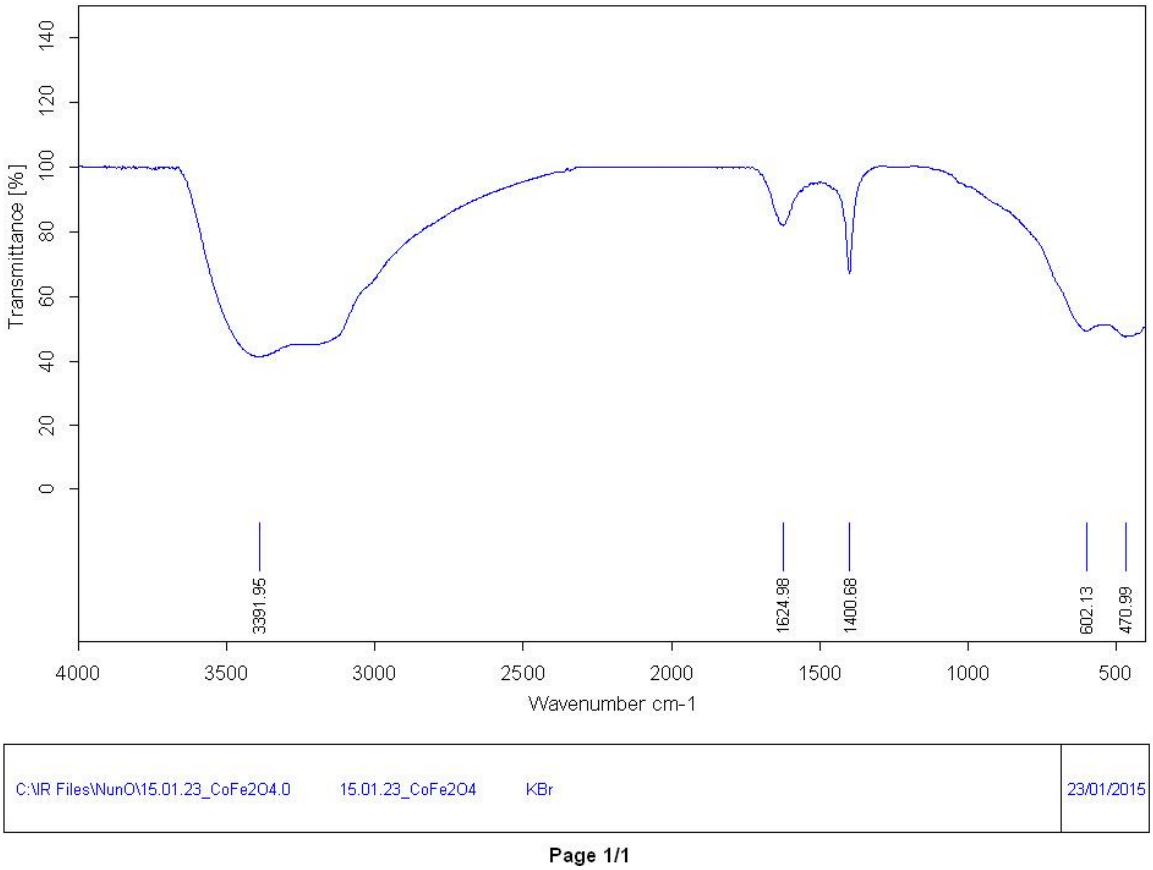


Figure S1.3. FT-IR spectrum of $CoFe_2O_4$ (**3**) in the range of 4000-400 cm^{-1}.

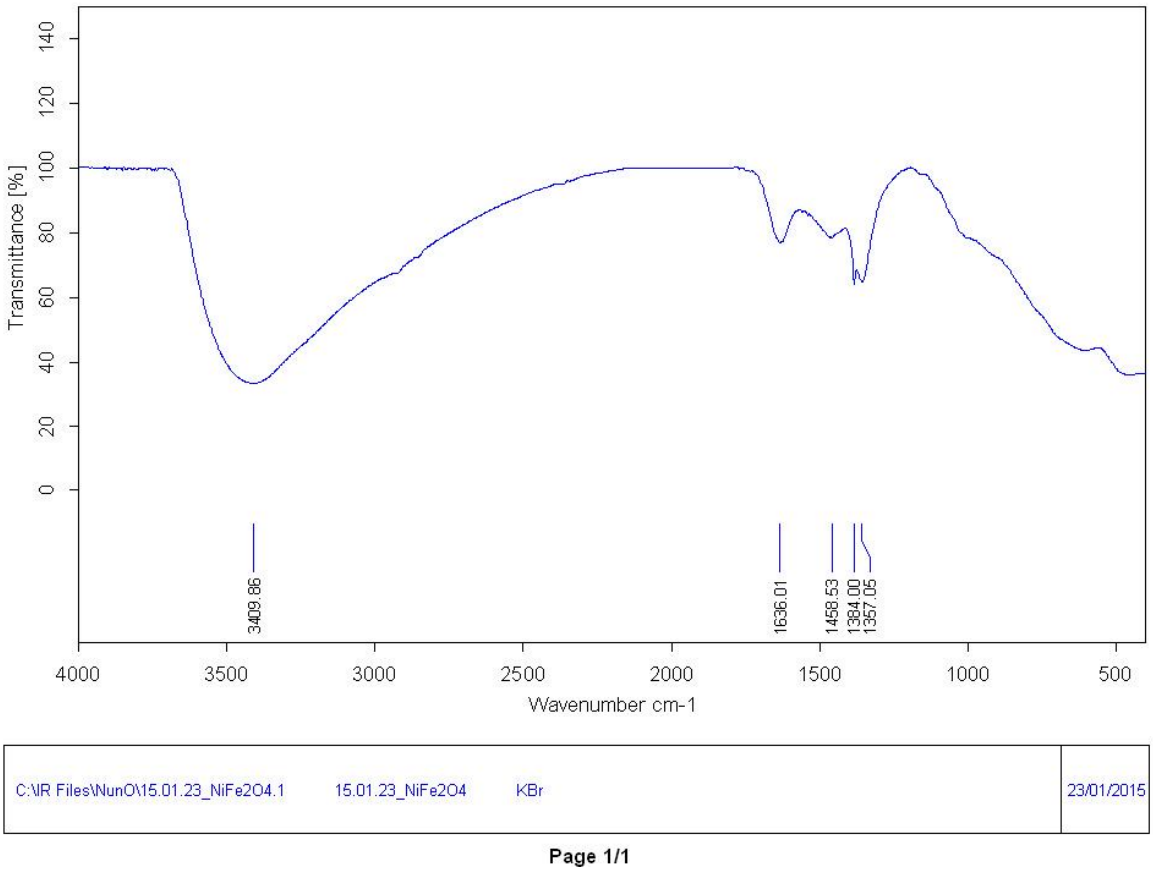


Figure S1.4. FT-IR spectrum of $NiFe_2O_4$ (**4**) in the range of 4000-400 cm^{-1}.

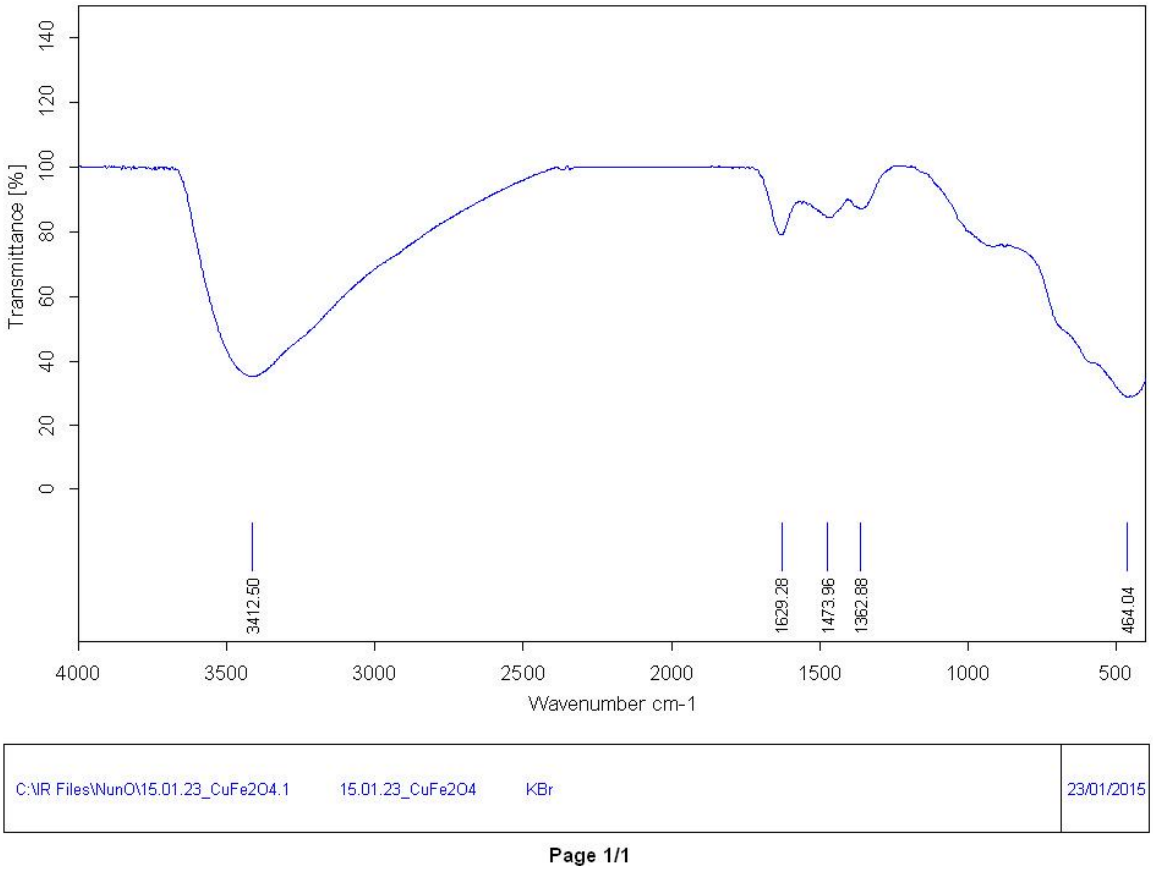


Figure S1.5. FT-IR spectrum of $CuFe_2O_4$ (**5**) in the range of 4000-400 cm^{-1}.

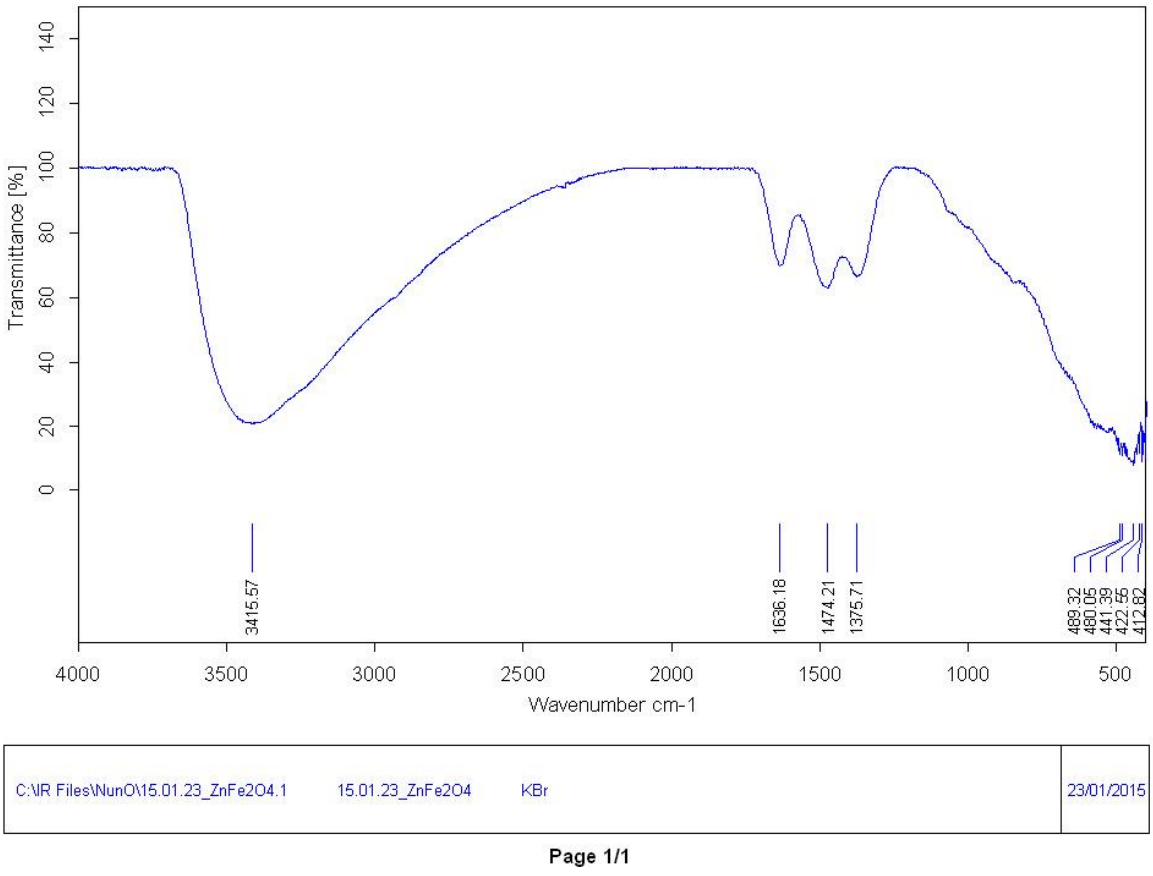


Figure S1.6. FT-IR spectrum of $ZnFe_2O_4$ (**6**) in the range of 4000-400 cm^{-1}.

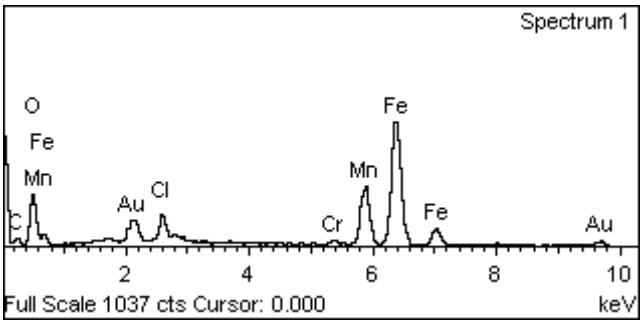


Figure S2.1. EDS spectrum of $MnFe_2O_4$ (**1**) NPs.

Table S2.1. Obtained EDS data related to $MnFe_2O_4$ (**1**) NPs.

Element	App Conc.	Intensity Corrn.	Weight%	Weight% Sigma	Atomic%
C K	-8.43	0.3717	-5.62	4.64	-19.56
O K	101.06	1.0496	23.87	2.18	62.34
Cl K	11.80	0.6943	4.21	0.37	4.97
Cr K	3.38	1.0240	0.82	0.21	0.66
Mn K	71.68	0.9220	19.28	1.10	14.66
Fe K	176.54	0.9482	46.16	2.43	34.54
Au M	34.00	0.7476	11.28	1.01	2.39
Totals			100.00		

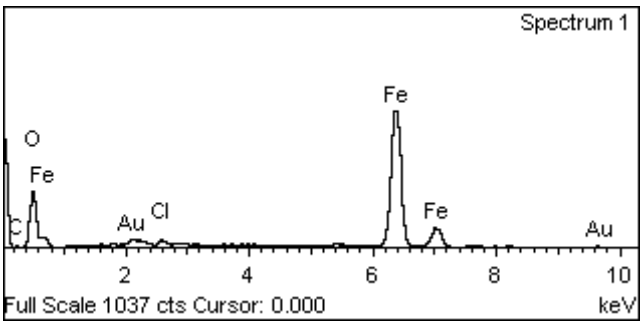


Figure S2.2. EDS spectrum of Fe_3O_4 (**2**) NPs.

Table S2.2. Obtained EDS data related to Fe_3O_4 (**2**) NPs.

Element	App Conc.	Intensity Corrn.	Weight%	Weight% Sigma	Atomic%
O K	135.15	1.3574	30.38	0.90	60.59
Cl K	2.57	0.7286	1.08	0.21	0.97
Fe K	205.49	0.9390	66.78	1.00	38.15
Au M	4.08	0.7045	1.77	0.75	0.29
Totals			100.00		

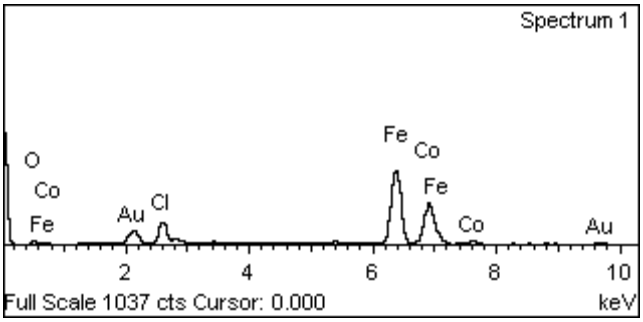


Figure S2.3. EDS spectrum of $CoFe_2O_4$ (**3**) NPs.

Table S2.3. Obtained EDS data related to $CoFe_2O_4$ (**3**) NPs.

Element	App Conc.	Intensity Corrn.	Weight%	Weight% Sigma	Atomic%
O K	9.68	0.8461	4.91	0.81	16.14
Cl K	11.66	0.6680	7.49	0.45	11.11
Fe K	109.54	0.9779	48.08	1.05	45.25
Co K	61.31	0.9700	27.13	0.89	24.20
Au M	20.49	0.7106	12.38	1.07	3.30
Totals			100.00		

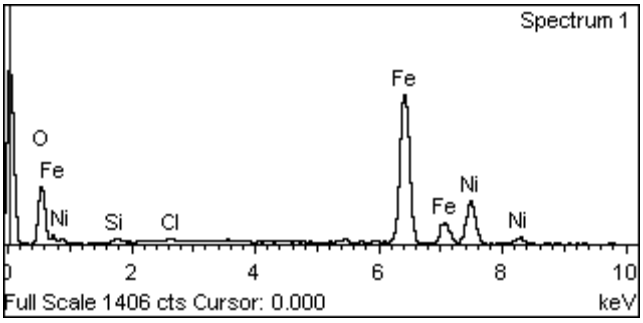


Figure S2.4. EDS spectrum of $NiFe_2O_4$ (**4**) NPs.

Table S2.4. Obtained EDS data related to $NiFe_2O_4$ (**4**) NPs.

Element	App Conc.	Intensity Corrn.	Weight%	Weight% Sigma	Atomic%
O K	151.48	1.2394	21.38	1.16	48.59
Si K	3.09	0.4939	1.09	0.18	1.42
Cl K	2.36	0.7037	0.59	0.14	0.60
Cr K	4.25	1.1211	0.66	0.14	0.46
Fe K	302.12	0.9875	53.52	0.92	34.84
Ni K	111.69	0.8589	22.75	0.60	14.09
Totals			100.00		

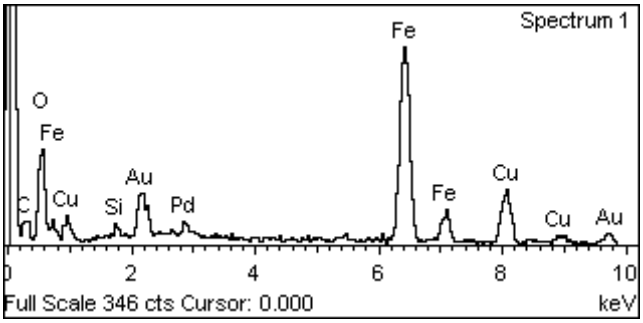


Figure S2.5. EDS spectrum of $CuFe_2O_4$ (**5**) NPs.

Table S2.5. Obtained EDS data related to $CuFe_2O_4$ (**5**) NPs.

Element	App Conc.	Intensity Corrn.	Weight%	Weight% Sigma	Atomic%
C K	-27.08	0.4134	-31.98	27.27	-228.33
O K	77.09	0.9683	38.87	8.21	208.35
Si K	1.42	0.5677	1.22	0.43	3.73
Fe K	97.17	0.9595	49.44	10.34	75.91
Cu K	39.50	0.8654	22.28	4.73	30.07
Pd L	6.02	0.7364	3.99	1.31	3.22
Au M	23.56	0.7109	16.18	3.59	7.04
Totals			100.00		

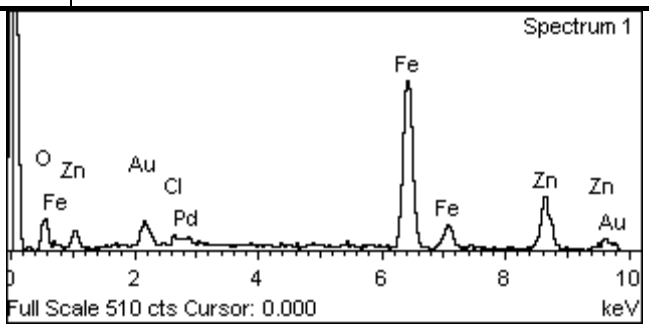


Figure S2.6. EDS spectrum of $ZnFe_2O_4$ (**6**) NPs.

Table S2.6. Obtained EDS data related to $ZnFe_2O_4$ (**6**) NPs.

Element	App Conc.	Intensity Corrn.	Weight%	Weight% Sigma	Atomic%
O K	39.28	0.9444	15.42	0.98	42.09
Cl K	1.96	0.6406	1.13	0.27	1.40
Fe K	123.38	0.9936	46.03	1.03	36.00
Zn K	66.11	0.8951	27.38	0.96	18.29
Au M	17.65	0.6522	10.03	1.00	2.22
Totals			100.00		

Table S3.1. XPS data of **1** NPs before and after (8th consecutive run) the peroxidative reaction of 1-phenylethanol.[a]

Element	Sens. Factor	Before run 1 (At %)	After run 8 (At %)
C 1s	0.278	25.61	27.83
O 1s	0.78	49.39	50.08
Mn 2p	2.66	6.73	6.64
Fe 2p	2.96	18.27	15.45

[a] Pondered analysis considering the regions of interest (100 % normalized).

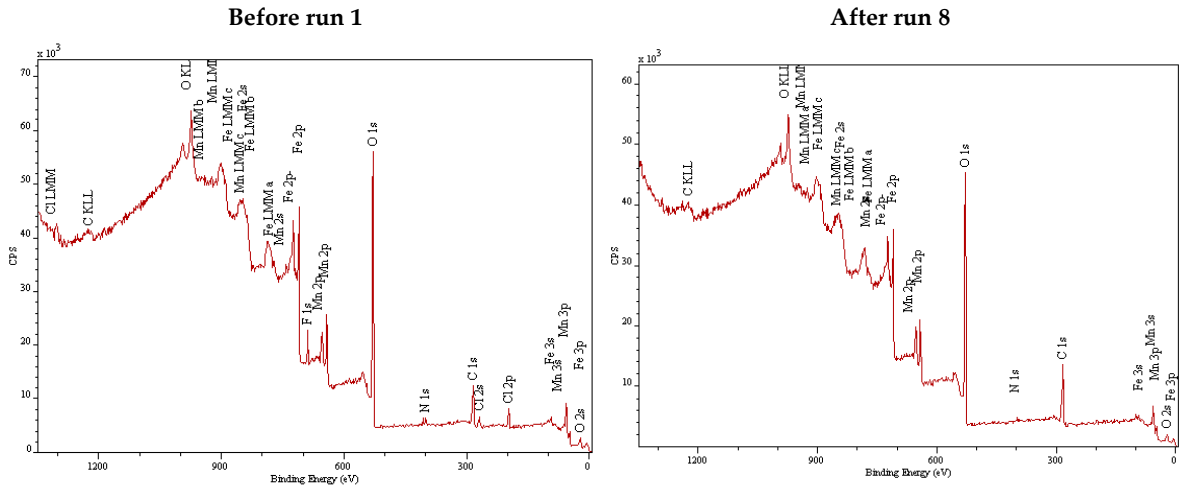


Figure S3.1. Overall XPS spectrum of $MnFe_2O_4$ (**1**) NPs.

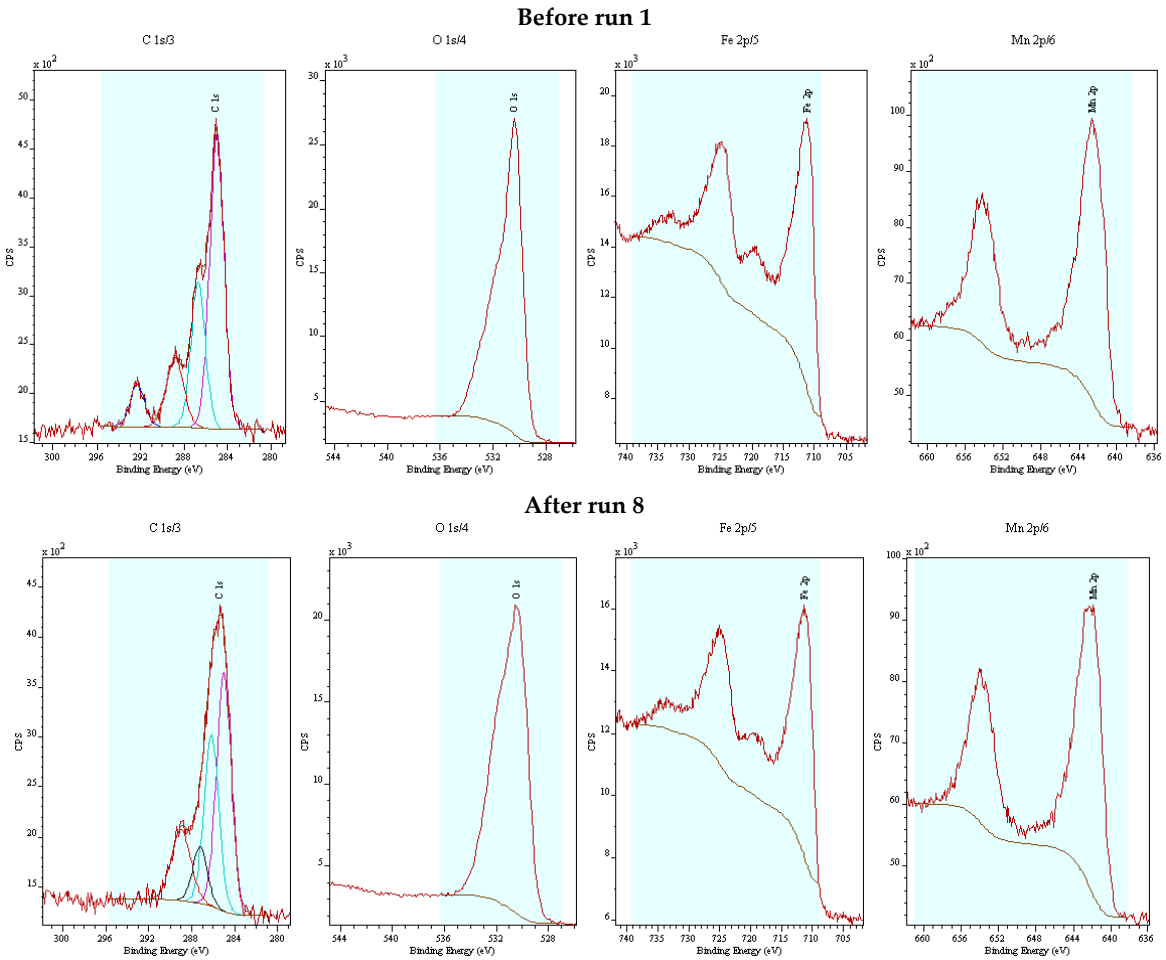


Figure S3.2. XPS spectrum of $MnFe_2O_4$ (**1**) NPs in regions of interest (ROI).

Table S3.2. XPS data of **2** NPs before and after (5th consecutive run) the peroxidative reaction of 1-phenylethanol.[a]

Element	Sens. Factor	Before run 1 (At %)	After run 5 (At %)
C 1s	0.278	40.88	13.73
O 1s	0.78	37.66	55.46
Fe 2p	2.96	21.46	30.80

[a] Pondered analysis considering the regions of interest (100 % normalized).

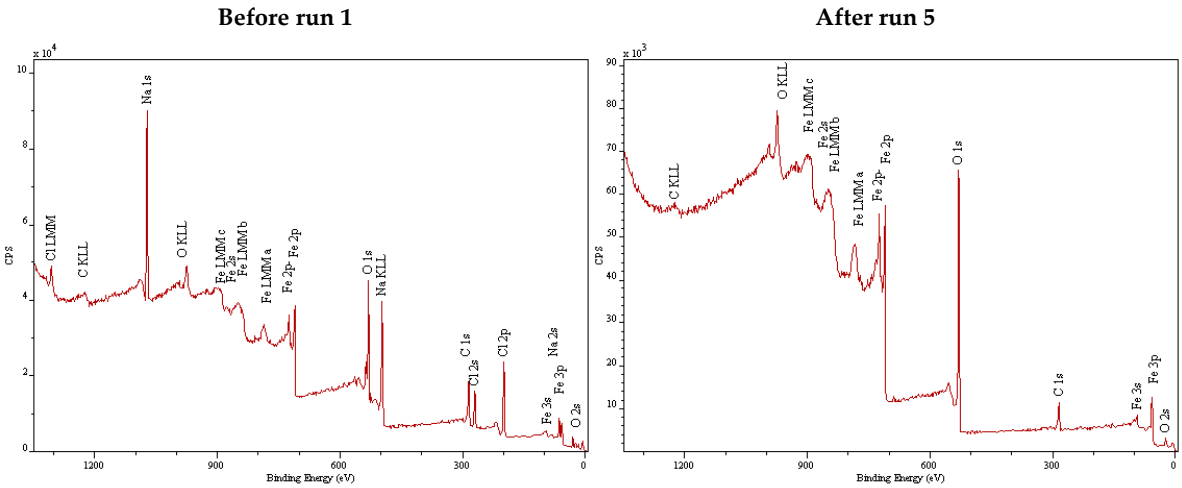


Figure S3.3. Overall XPS spectrum of Fe_3O_4 (**2**) NPs.

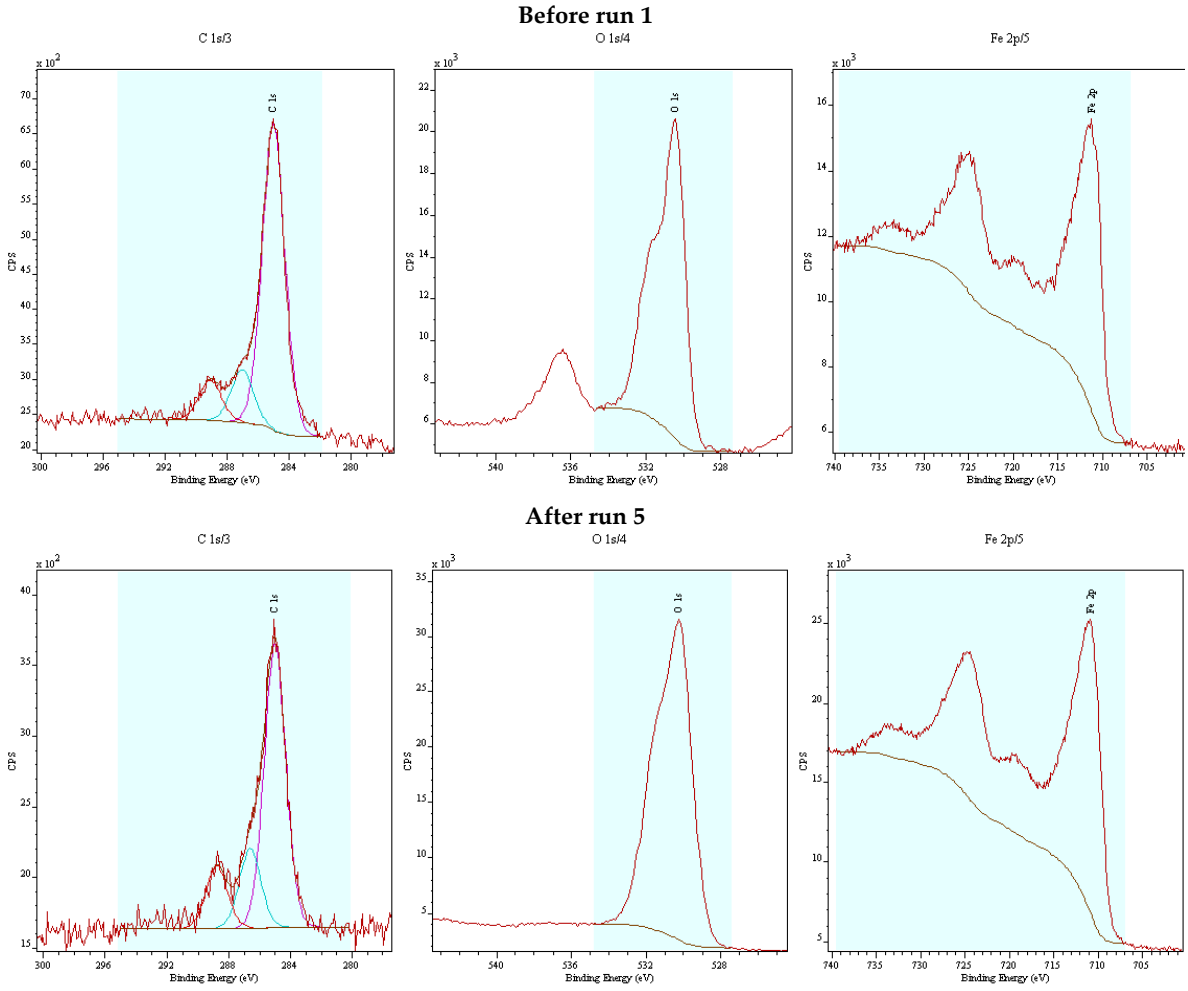


Figure S3.4. XPS spectrum of Fe_3O_4 (**2**) NPs in regions of interest (ROI).

Table S4.3. XPS data of **3** NPs before and after (7th consecutive run) the peroxidative reaction of 1-phenylethanol.[a]

Element	Sens. Factor	Before run 1 (At %)	After run 7 (At %)
C 1s	0.278	29.12	23.87
O 1s	0.78	44.02	45.56
Fe 2p	2.96	17.20	20.23
Co 2p	3.59	9.66	10.33

[a] Pondered analysis considering the regions of interest (100 % normalized).

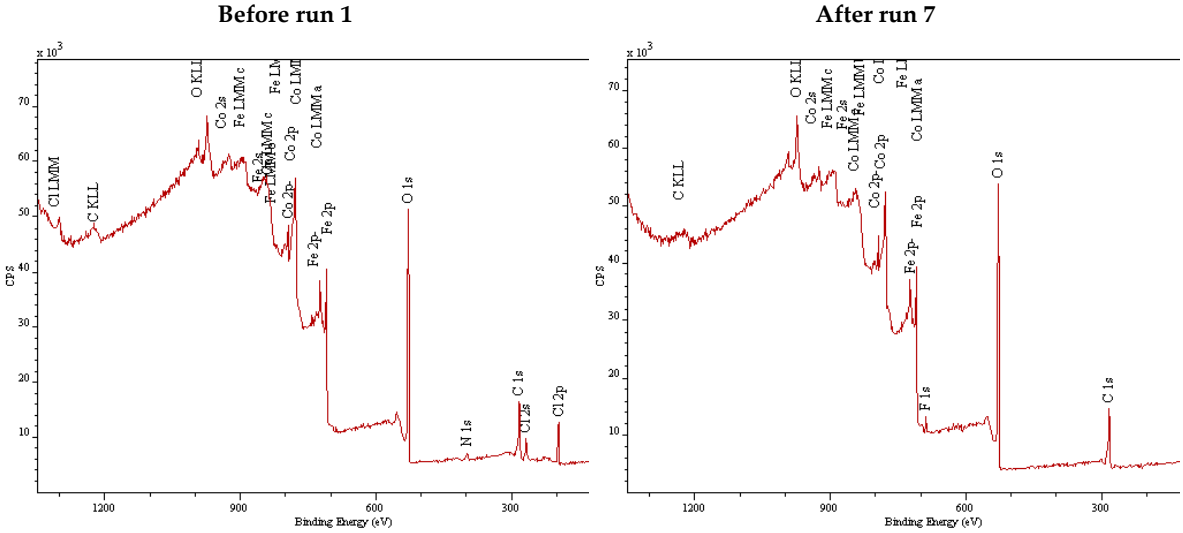
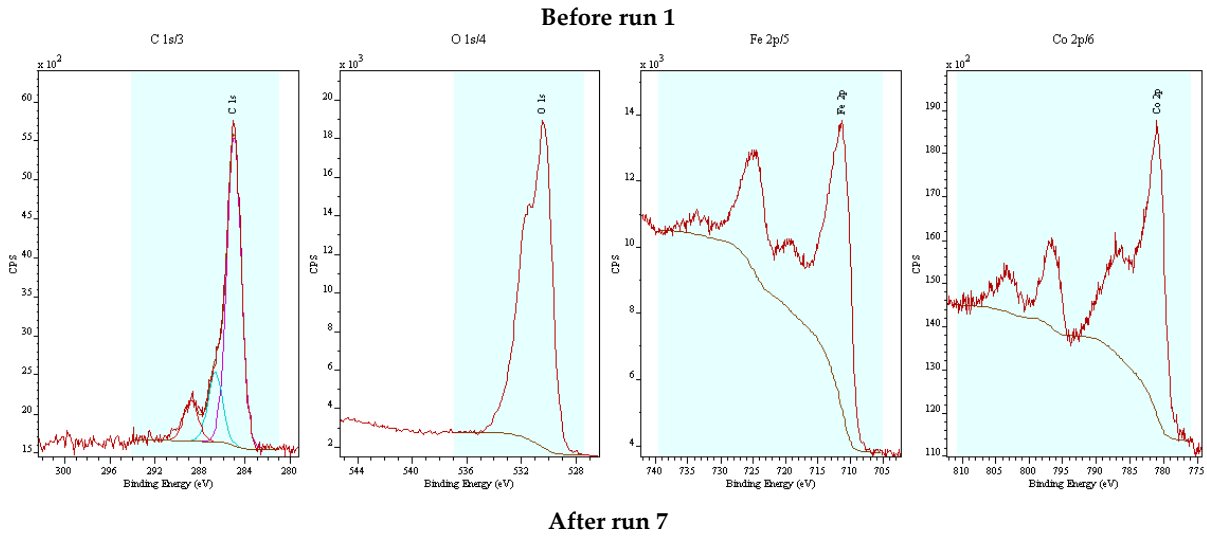


Figure S3.5. Overall XPS spectrum of $CoFe_2O_4$ (**3**) NPs.



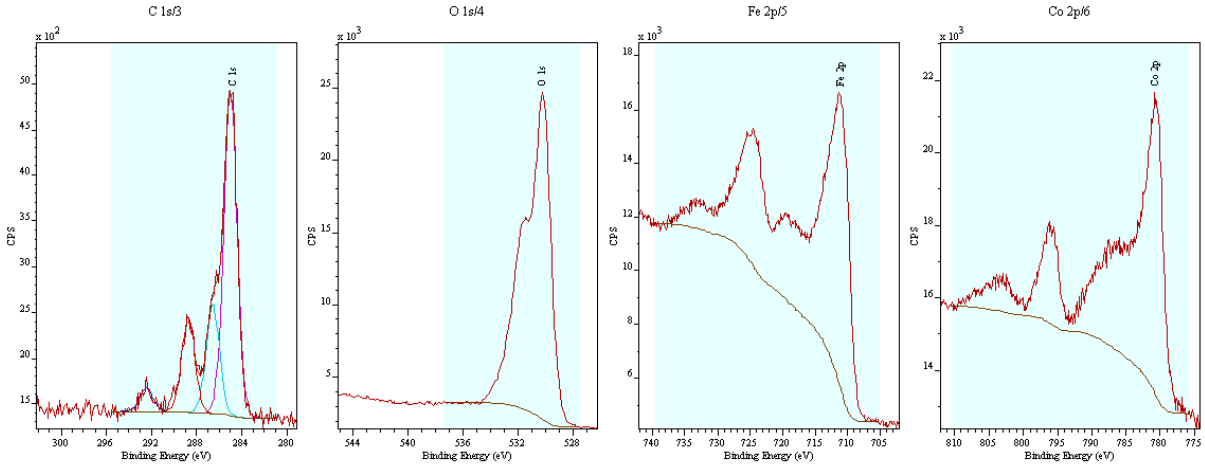


Figure S3.6. XPS spectrum of $CoFe_2O_4$ (**3**) NPs in regions of interest (ROI).

Table S3.4. XPS data of **4** NPs before and after (5th consecutive run) the peroxidative reaction of 1-phenylethanol.[a]

Element	Sens. Factor	Before run 1 (At %)	After run 5 (At %)
C 1s	0.278	30.30	16.62
O 1s	0.78	43.42	50.27
Fe 2p	2.96	17.45	21.47
Cu 2p	5.32	8.83	11.64

[a] Pondered analysis considering the regions of interest (100 % normalized).

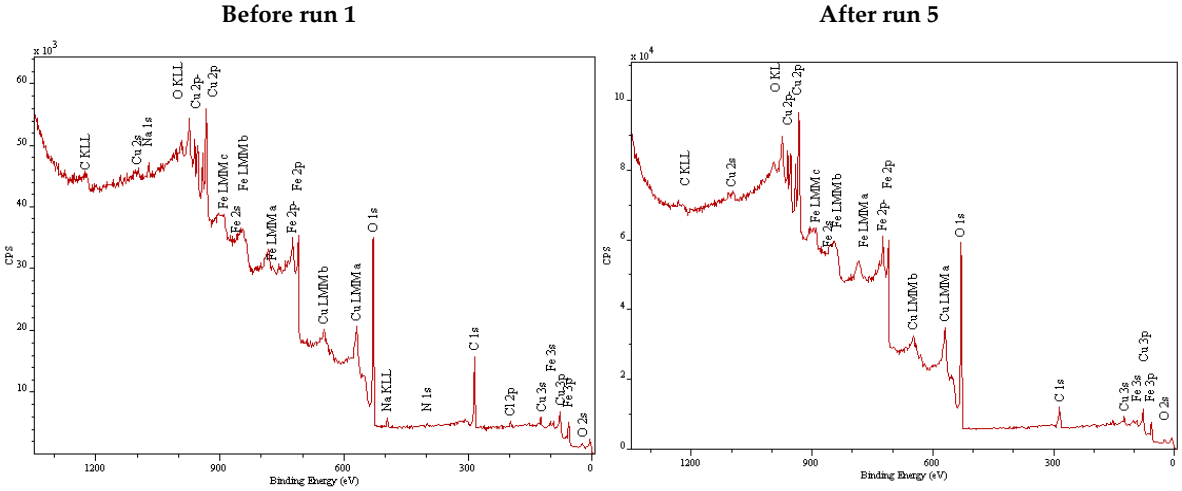


Figure S3.7. Overall XPS spectrum of $CuFe_2O_4$ (**4**) NPs.

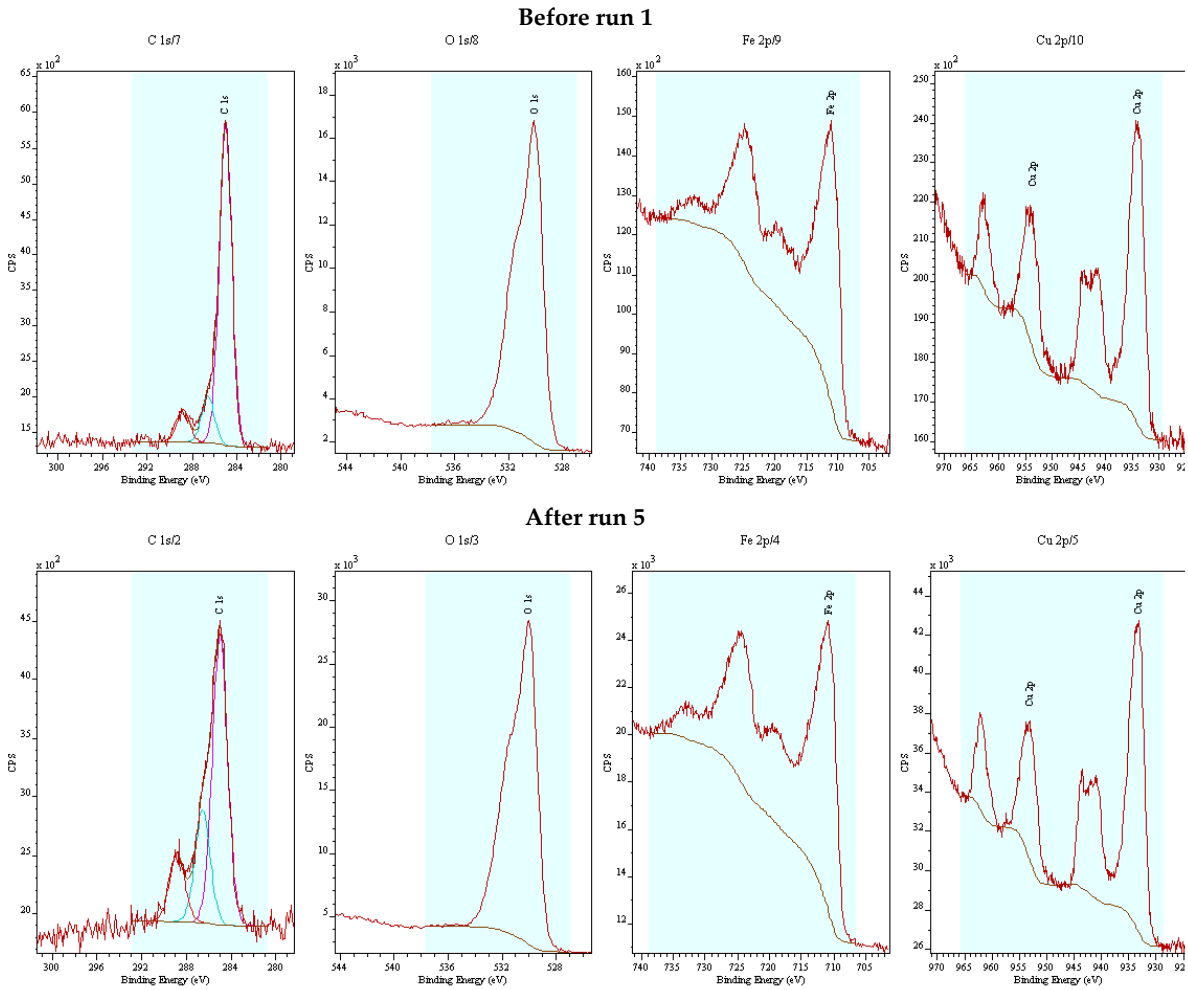


Figure S3.8. XPS spectrum of $CuFe_2O_4$ (**4**) NPs in regions of interest (ROI).