Electronic Supplementary Material (ESI) for Journal of Analytical Atomic Spectrometry.

Supplement

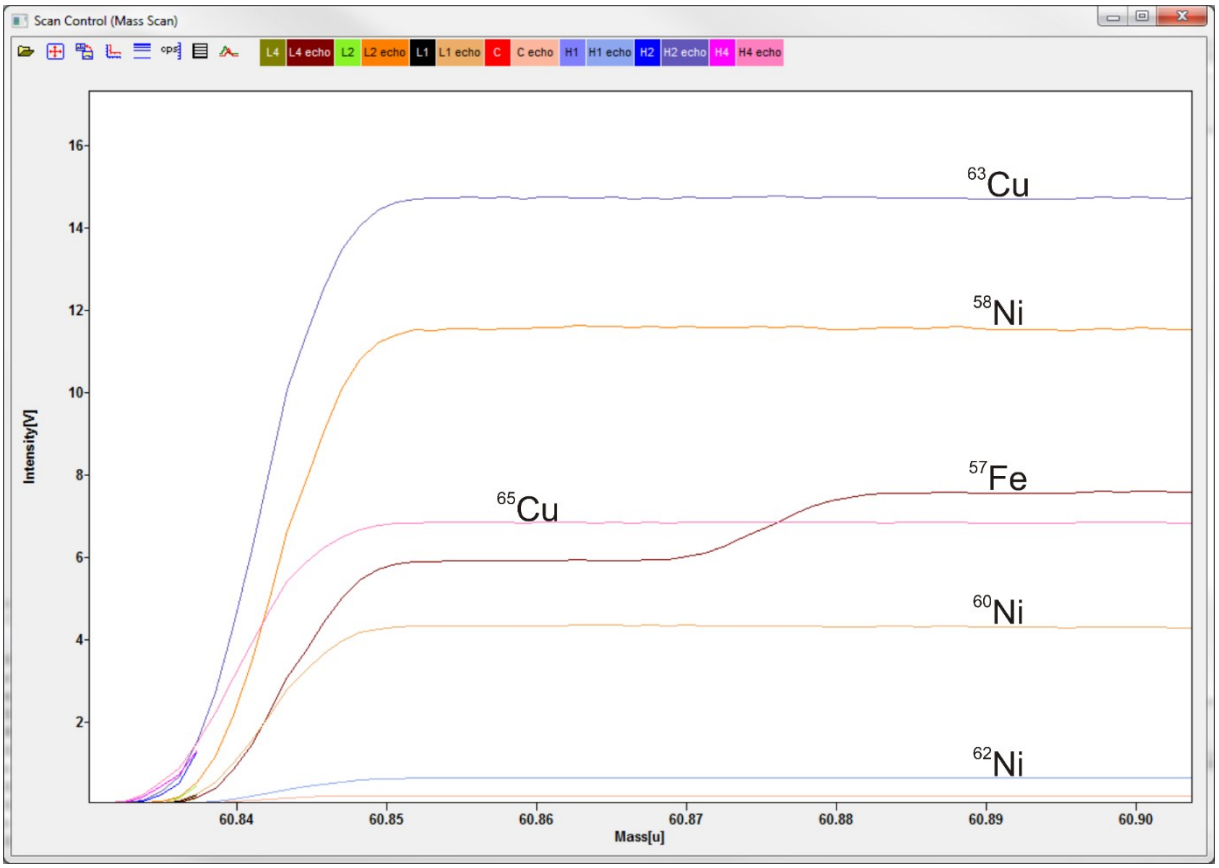

Figure S1: Image of a mass scan during *fs*-LA-MC-ICP-MS measurement on a Ni standard. The mass scan reveals that all Ni and Cu isotopes, as well as ^{57}Fe can be measured free from argide or oxide interferences. The measured isotopes are written above the respective lines. The lowest line displays the intensity of ^{61}Ni.

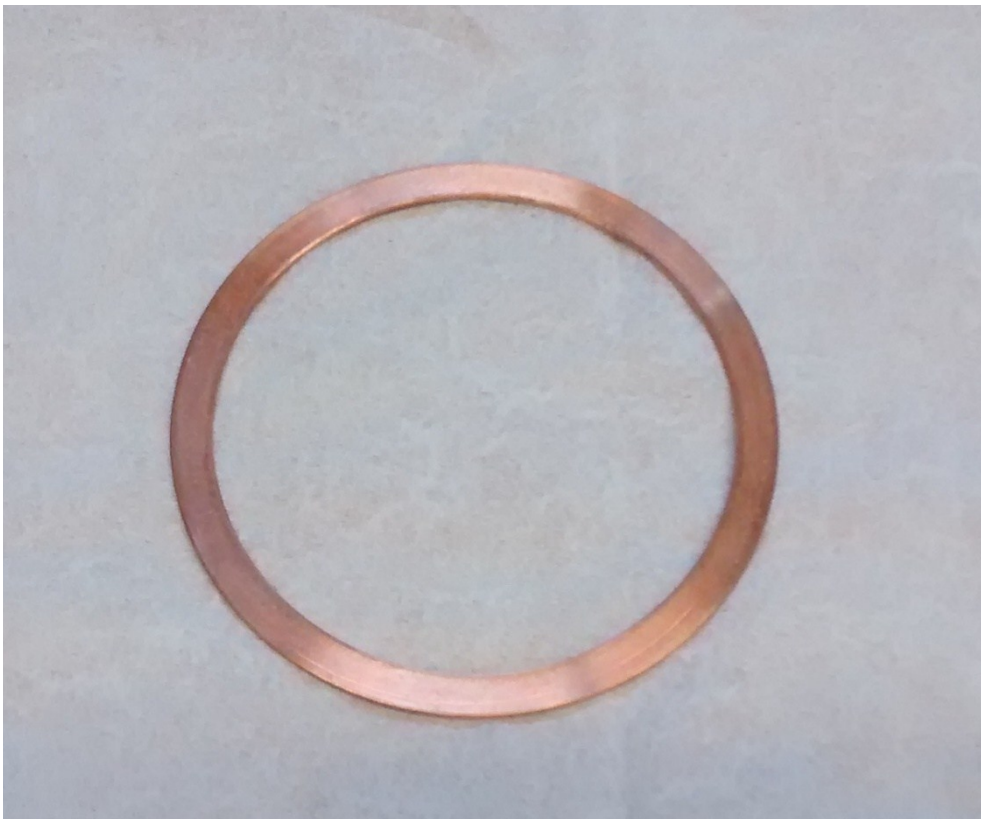

Figure S2: This photograph displays a copper spacer with a thickness of 0.8 mm. The spacer enhances the intensities by increasing the distance between the sample cone and the skimmer cone.

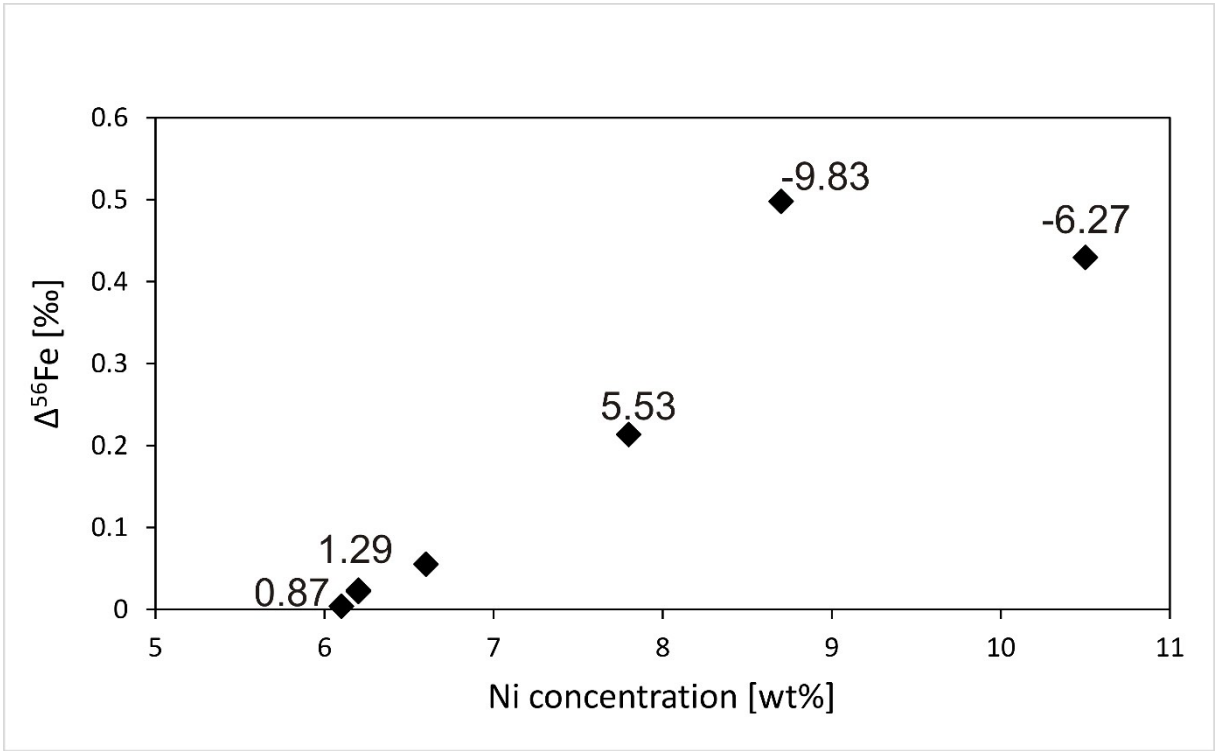

Figure S3: This diagram shows the offset of the measured $\delta^{56}Fe$, if the Ni mass bias was monitored simultaneously to Fe isotope analyses with LA-MC-ICP-MS, relative to an "interpolation method" for

which Ni mass bias was monitored before and after Fe isotope analyses and applied to the bracketed Fe isotope analyses (see text for further explanation). The offset, shown as $\Delta^{56}Fe$ is plotted against the Ni concentration of the respective sample. The numbers given with the data points are the $\delta^{62/60}Ni$ values of the grains. Samples with more than ~ 7 wt% and a Ni isotope composition that differs by more than ~1.5 ‰ from that of the Ni standard generate an offset in the analyzed Fe isotope composition ($\Delta^{56}Fe$) outside the analytical uncertainty (0.1‰), i.e for those samples, the "interpolation method" needs to be performed.

Table S1: Cup configuration of bulk solution nebulization and laser ablation MC-ICP-MS analyses for Ni.

Cup configuration for Ni isotope analyses

cup	L4	L2	L1	C	H1	H2	H4
isotope	^{57}Fe	^{58}Ni	^{60}Ni	^{61}Ni	^{62}Ni	^{63}Cu	^{65}Cu

Table S2: Typical instrument settings of the MC-ICP-MS during laser ablation measurements.

Instrumental settings of Neptune Plus for LA-MC-ICP-MS analyses	
Cool gas: Ar (l min-1)	15
Aux gas: Ar (l min -1)	0.86
Sample gas: Ar (l min -1)	0.885
Carrier gas: He (l min-1)	0.49
nebulizer uptake rate (µl min -1)	100
RF generator power (W)	1210
Accelerator voltage (V)	-10000
Extraction (V)	1898
Focus (V)	-590

Table S3: δ^{62}Ni of single analyses of the Ni-rod and BAM-D184.1 measured in bracketing with NIST RM 1226 and re-calculated to SRM 986.

δ^{62}Ni [‰]			
BAM (RM 1226)	BAM (SRM 986)	Ni-rod (RM 1226)	Ni-rod (SRM 986)
0.31	0.03	-0.01	-0.29
0.42	0.14	0.02	-0.26
0.29	0.01	0.09	-0.19
0.40	0.13	-0.03	-0.31
0.35	0.07	0.01	-0.27
0.41	0.13	0.02	-0.26
0.36	0.08	0.00	-0.28
0.30	0.02		
0.37	0.09		
0.45	0.17		
0.34	0.06		

0.42	0.14
0.38	0.10
0.32	0.04
0.36	0.08
0.38	0.10
0.39	0.11
0.40	0.12
0.38	0.10
0.37	0.09
0.34	0.06
0.30	0.02
0.35	0.07
0.46	0.18
0.34	0.06
0.32	0.04
0.35	0.07
0.33	0.05
0.35	0.07
0.38	0.10
0.44	0.16
0.38	0.10
0.41	0.13
0.38	0.10
0.34	0.06
0.40	0.12
0.38	0.10
0.38	0.10