

Supplementary Material

Signal enhancement / suppression factors (emission line signal obtained in the given reagent divided by the signal obtained in 3% v/v HNO₃) by various reagents and circuit schematics of the analog to digital converter used to tap the control lines of the RF generator's high voltage power supply. The firmware of the microcontroller (ATSAM3X8E on an "Arduino Due - open source electronics prototyping platform"; www.arduino.cc) is available from the author upon request.

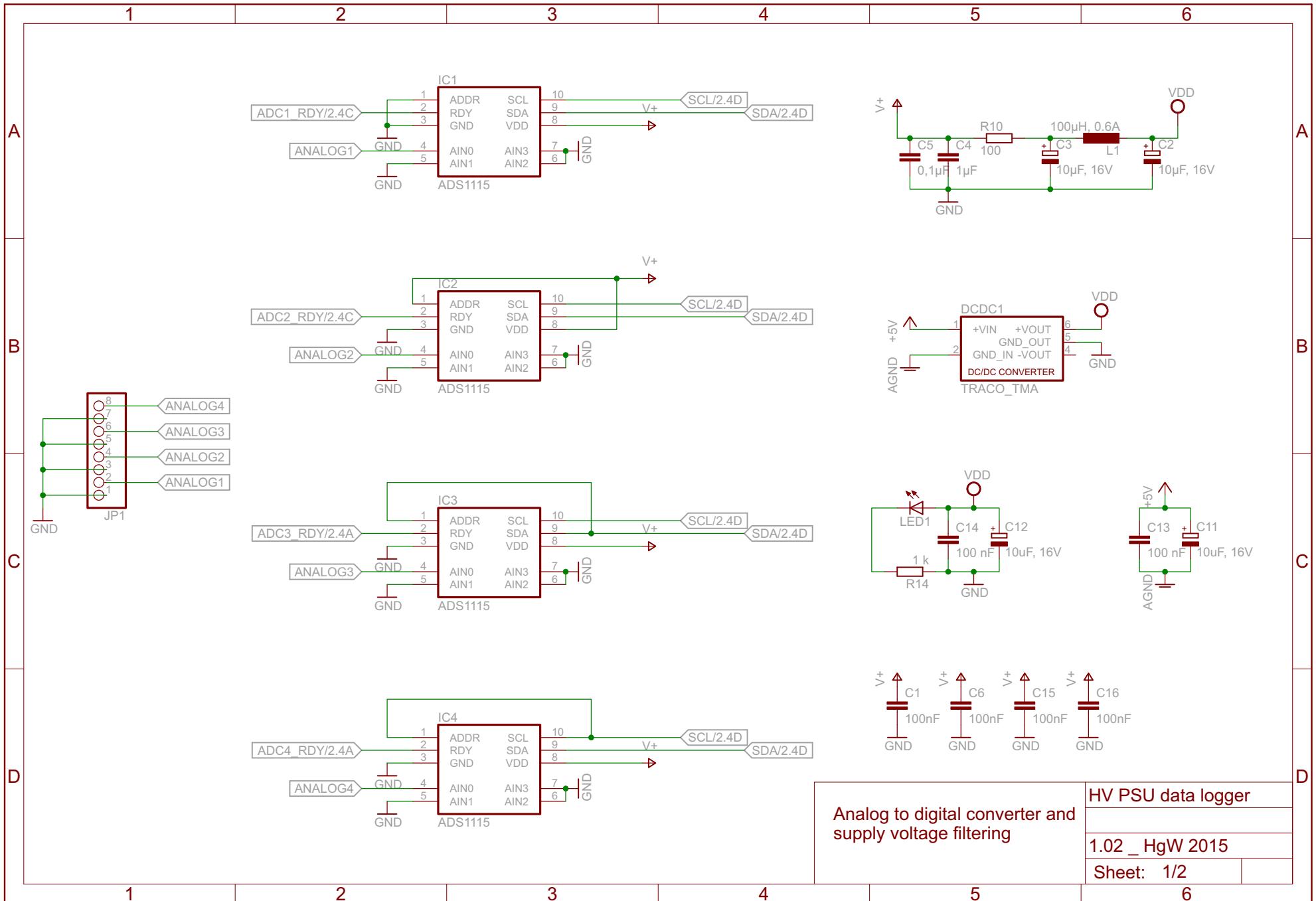
ESM Table 1 Signal enhancement / suppression factors emission line signal obtained in the given reagent divided by the signal obtained in 3% v/v HNO₃ by various reagents. ND: not determined; LR: line rejected - spectral interference defined as blank signal > 10% of the signal in the analyte containing solution before blank subtraction; RSD < 3 % for all emission lines

Emission line, nm	Total Line Energy, eV	Methanol	Phenyl-alanine	CO ₂ added to the aerosol gas stream	CO ₂ added to the intermediate gas flow	Br ₂	NaCl
	10 %	8 g/L C	15 sccm	15 sccm	34 g/L	30 g/L	
Ag II 224.641	17.95	1.68	1.01	ND	ND	ND	ND
Ag I 328.068	3.78	1.03	0.99	ND	ND	ND	ND
Ag I 338.289	3.66	1.02	0.99	ND	ND	ND	ND
Al II 167.078	13.41	1.50	1.02	1.04	1.83	0.95	0.69
Al I 308.215	4.02	1.09	0.98	LR	LR	LR	LR
Al I 394.401	3.14	1.01	0.98	0.76	1.28	1.07	0.79
Al I 396.152	3.14	1.00	0.98	0.76	1.27	1.06	0.79
Ar I 404.442	14.69	1.97	0.98	1.36	2.49	0.88	0.90
Ar I 430.01	14.51	1.94	0.98	1.34	2.40	0.88	0.91
As I 189.042	6.56	1.97	1.08	1.52	2.08	1.04	0.83
As I 193.759	6.40	1.90	1.07	1.48	2.01	1.04	0.84
As I 197.262	6.29	1.92	1.08	1.47	1.98	1.03	0.84
Au II 174.05	18.22	LR	0.99	LR	LR	LR	LR
Au I 201.2	7.30	1.35	1.00	LR	1.47	1.06	0.80
Au I 242.795	5.11	1.18	1.00	0.92	1.25	1.03	0.81
Au I 267.595	4.63	1.09	1.00	0.89	1.17	1.02	0.82
B II 136.246	17.40	LR	1.05	ND	ND	ND	ND
B I 182.641	6.79	LR	1.01	ND	ND	ND	ND
B I 208.959	5.93	LR	1.00	ND	ND	ND	ND
B I 249.677	4.96	1.16	0.98	0.95	1.25	1.01	0.76
B I 249.773	4.96	1.16	0.97	0.94	1.26	1.01	0.76
Ba II 230.424	11.19	1.10	1.01	ND	ND	ND	ND
Ba II 233.527	11.22	1.08	1.02	ND	ND	ND	ND
Ba II 455.404	7.93	0.84	1.02	ND	ND	ND	ND
Be I 234.861	5.28	1.18	0.99	0.93	1.28	0.96	0.75
Be II 313.042	13.28	1.42	1.08	1.07	1.40	1.05	0.66
Be II 313.107	13.28	1.42	1.08	1.07	1.41	1.05	0.66
Bi II 190.241	15.91	LR	0.99	LR	1.43	0.87	0.68
Bi I 222.825	5.56	1.09	0.98	0.80	1.20	0.92	0.74
Bi I 223.061	5.56	1.03	0.97	0.78	1.18	0.94	0.74
Br I 144.99	8.55	LR	0.98	LR	1.73	ND	ND
Br I 148.845	8.33	1.57	0.98	LR	1.59	ND	ND
Br I 154.065	8.05	1.58	0.98	LR	LR	ND	ND
Ca II 183.801	14.55	LR	1.04	LR	LR	LR	LR
Ca II 315.887	13.16	1.24	1.03	0.86	1.44	1.00	0.66
Ca II 317.933	13.16	1.22	1.03	0.87	1.44	0.99	0.66
Ca II 393.366	9.26	0.90	1.04	0.69	0.99	0.97	0.65

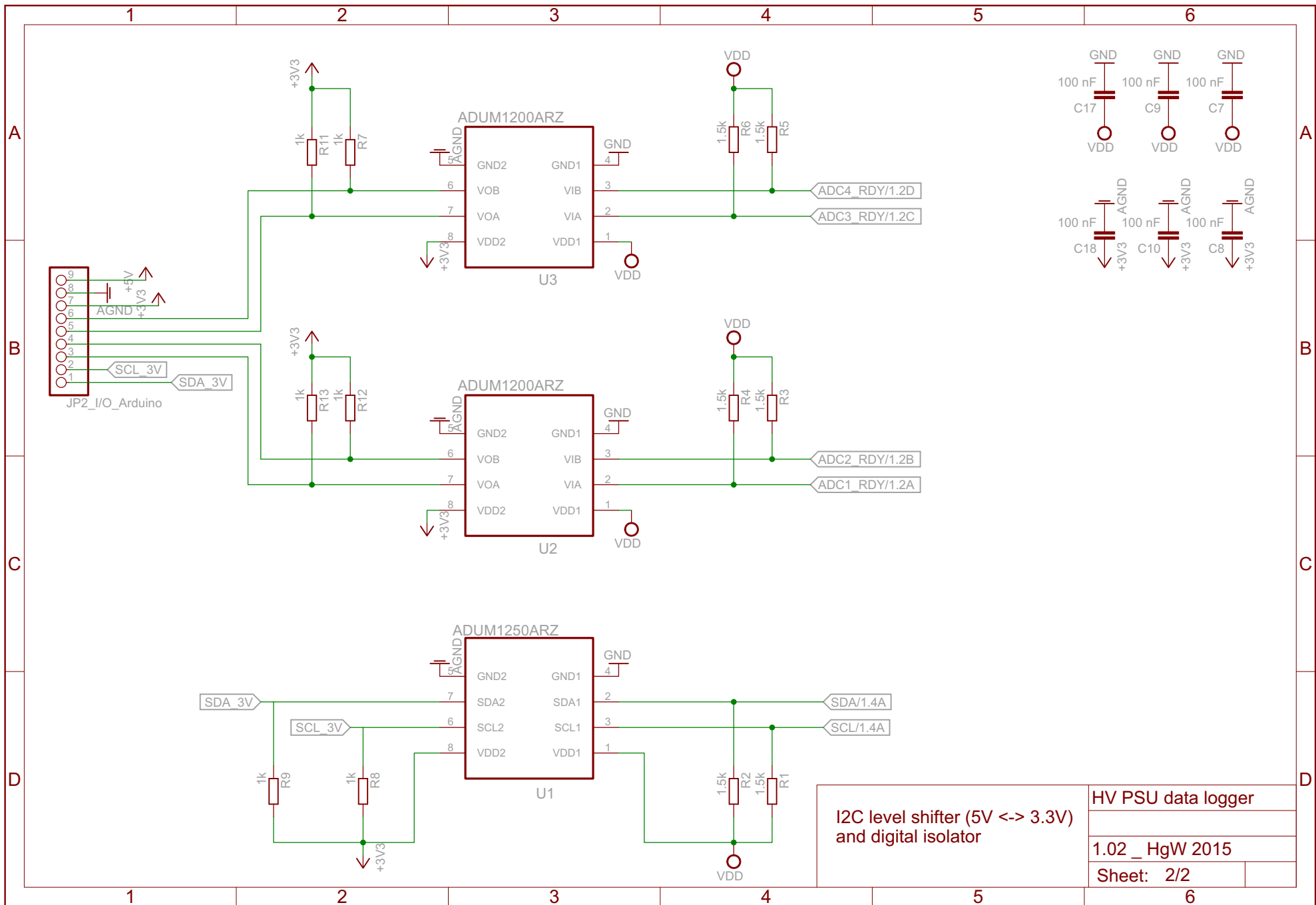
Emission line, nm	Total Line Energy, eV	Methanol	Phenylalanine	CO ₂ added to the aerosol gas stream	CO ₂ added to the intermediate gas flow	Br ₂	NaCl
		10 %	8 g/L C	15 sccm	15 sccm	34 g/L	30 g/L
Ca II 396.847	9.24	0.90	1.03	0.67	0.95	0.95	0.65
Ca I 422.673	2.93	0.99	0.96	0.70	1.26	1.29	LR
Cd II 214.438	14.77	1.57	1.04	1.07	1.85	0.91	0.67
Cd II 226.502	14.46	1.40	1.03	0.98	1.65	0.90	0.68
Cd I 228.802	5.42	1.31	1.02	0.98	1.44	0.97	0.79
Cd I 361.051	7.38	1.08	1.04	0.81	1.15	0.96	0.74
Cl I 134.724	9.20	1.77	0.99	1.20	2.03	0.83	ND
Cl I 135.165	9.28	2.59	1.04	2.16	3.21	0.88	ND
Cl I 136.345	9.20	1.75	1.00	1.12	1.92	0.89	ND
Co II 228.616	13.72	1.21	1.02	0.85	1.40	0.89	0.65
Co II 230.786	13.75	1.19	1.02	0.85	1.40	0.90	0.65
Co II 238.892	13.48	1.15	1.01	0.82	1.34	0.89	0.63
Cr II 205.552	12.80	1.20	1.03	0.86	1.36	0.95	0.67
Cr II 283.563	12.69	1.14	1.03	0.83	1.32	0.94	0.67
Cr II 284.325	12.65	1.13	1.02	0.83	1.31	0.93	0.66
Cr II 284.984	12.62	1.15	1.04	0.81	1.27	0.94	0.66
Cu II 219.226	16.22	1.49	1.03	1.01	1.84	0.89	0.63
Cu I 219.958	7.02	1.24	1.00	0.90	1.40	0.94	0.72
Cu II 224.7	15.96	1.24	1.01	0.83	1.48	0.88	0.64
Cu I 324.754	3.82	0.93	1.02	0.74	1.02	1.01	0.75
Cu I 327.396	3.79	0.92	1.01	0.75	1.04	1.02	0.77
Fe II 238.204	13.11	1.20	1.01	0.86	1.39	0.85	0.65
Fe II 239.562	13.12	1.20	1.01	0.86	1.39	0.85	0.65
Fe II 241.331	13.16	1.18	1.01	0.85	1.38	0.85	0.65
Fe II 244.451	15.56	1.34	1.00	0.92	1.69	0.84	0.63
Fe II 259.941	12.67	1.11	1.00	0.81	1.27	0.83	0.64
Fe II 261.187	12.70	1.11	1.01	0.81	1.28	0.83	0.64
Fe II 262.567	12.67	1.19	1.01	0.84	1.39	0.85	0.64
Fe II 262.829	12.74	1.12	1.00	0.82	1.29	0.83	0.64
Fe I 373.486	4.18	0.96	1.04	0.76	1.13	0.96	0.83
Hg I 184.95	6.70	1.45	1.00	1.16	1.79	0.98	0.85
Hg II 194.227	16.82	1.41	1.01	1.05	1.77	0.91	0.77
Hg I 253.652	4.89	0.97	0.99	0.84	1.12	0.99	0.83
Hg I 435.835	7.73	1.20	0.99	LR	1.43	0.89	0.75
I I 142.549	8.70	1.70	1.06	LR	LR	ND	0.87
I I 161.76	7.66	LR	1.04	LR	LR	ND	LR
I I 178.276	6.95	1.69	1.05	LR	2.07	ND	0.83
I I 179.909	7.83	LR	1.06	LR	LR	ND	LR
I I 183.038	6.77	1.52	1.04	1.20	1.86	ND	0.76
K I 766.491	1.62	1.08	0.95	ND	ND	ND	ND
Mg II 279.079	16.51	1.38	0.97	0.87	1.79	0.85	0.59
Mg II 279.553	12.08	1.16	1.03	0.84	1.35	0.95	0.62

Emission line, nm	Total Line Energy, eV	Methanol	Phenylalanine	CO ₂ added to the aerosol gas stream	CO ₂ added to the intermediate gas flow	Br ₂	NaCl
		10 %	8 g/L C	15 sccm	15 sccm	34 g/L	30 g/L
Mg II 280.27	12.07	1.14	1.00	0.84	1.35	0.95	0.61
Mg I 285.213	4.35	1.00	0.96	0.73	1.28	0.95	0.79
Mn II 257.611	12.25	1.07	0.99	0.80	1.28	0.92	0.64
Mn II 259.373	12.21	1.07	0.99	0.80	1.28	0.91	0.64
Mn II 260.569	12.19	1.08	1.00	0.79	1.26	0.92	0.64
Mn II 294.921	12.81	1.15	1.02	0.86	1.36	0.92	0.64
Mn I 403.076	3.08	0.75	0.98	0.58	0.95	1.06	0.78
Mo II 202.03	13.22	1.21	1.05	0.87	1.30	0.94	0.71
Mo II 203.844	13.17	1.21	1.04	LR	1.33	0.94	0.71
Mo II 204.598	13.15	1.19	1.05	0.86	1.30	0.94	0.71
Mo II 281.615	13.16	1.15	1.04	0.83	1.27	0.93	0.70
Na I 330.237	3.75	1.17	0.92	ND	ND	ND	ND
Na I 330.298	3.75	1.09	0.88	ND	ND	ND	ND
Na I 588.995	2.10	0.86	0.93	ND	ND	ND	ND
Na I 589.592	2.10	0.86	0.92	ND	ND	ND	ND
Ni II 221.648	14.27	1.31	1.03	0.91	1.55	0.89	0.65
Ni II 227.021	14.26	1.29	1.02	0.90	1.52	0.88	0.64
Ni II 231.604	14.03	1.25	1.02	0.88	1.47	0.89	0.64
Ni I 232.003	5.34	1.11	0.99	0.83	1.27	0.96	0.75
Ni I 300.249	4.15	0.96	1.01	0.76	1.10	0.98	0.77
Ni I 341.476	3.66	0.88	1.02	0.71	1.00	1.02	0.82
P I 138.147	8.97	2.00	1.03	1.65	2.16	1.13	0.88
P I 168.599	8.76	2.14	1.05	LR	LR	LR	LR
P I 169.403	8.73	2.08	1.05	1.71	2.21	1.13	0.81
P I 177.495	6.99	1.89	1.04	1.56	2.00	1.13	0.86
P I 178.287	6.95	1.87	1.03	LR	2.01	1.13	0.86
P I 213.618	7.21	2.09	1.03	1.63	2.20	1.14	0.86
P I 214.914	7.18	2.11	1.03	1.65	2.20	1.14	0.86
Pb II 220.353	14.79	1.29	0.99	0.88	1.63	0.91	0.65
Pb I 283.305	4.38	0.97	0.97	0.77	1.16	1.02	0.76
Pb I 405.778	4.38	0.99	0.99	0.81	1.18	1.07	0.81
S I 142.503	8.70	1.44	0.97	LR	LR	1.17	0.93
S I 180.731	6.86	1.59	0.97	1.18	LR	1.18	0.94
S I 182.034	6.86	1.64	0.98	1.17	1.67	1.19	0.91
Sb I 187.115	6.63	LR	1.00	LR	LR	0.98	0.77
Sb I 206.833	5.99	1.24	1.00	LR	LR	LR	LR
Sb I 217.581	5.70	1.18	1.00	0.92	1.32	0.98	0.78
Sc II 256.023	11.41	ND	ND	1.09	1.07	ND	ND
Sc I and II 335.373	-	ND	ND	1.04	1.02	ND	ND
Sc II 355.855	10.05	ND	ND	1.05	1.02	ND	ND
Sc II 361.384	10.01	ND	ND	1.06	1.03	ND	ND
Sc II 364.279	9.96	ND	ND	1.07	1.05	ND	ND

Emission line, nm	Total Line Energy, eV	Methanol	Phenylalanine	CO ₂ added to the aerosol gas stream	CO ₂ added to the intermediate gas flow	Br ₂	NaCl
		10 %	8 g/L C	15 sccm	15 sccm	34 g/L	30 g/L
Sc I 390.749	3.17	ND	ND	0.88	0.86	ND	ND
Sc II 424.683	9.80	ND	ND	1.03	0.99	ND	ND
Sc II 429.477	10.05	ND	ND	1.04	1.01	ND	ND
Sc II 432.501	10.02	ND	ND	1.06	1.03	ND	ND
Sc II 437.446	10.01	ND	ND	1.07	1.05	ND	ND
Se I 196.09	6.32	2.51	1.20	1.98	2.89	1.86	0.78
Se I 203.985	6.32	2.64	1.22	2.02	2.97	1.83	0.78
Se I 207.479	5.97	2.24	1.22	LR	2.37	1.85	0.71
Sr II 407.771	10.38	0.89	1.02	0.69	0.96	0.97	0.66
Sr II 421.552	10.28	0.84	1.02	0.66	0.93	0.98	0.65
Sr I 460.733	2.69	0.96	0.96	0.68	1.19	1.26	LR
Ti II 307.864	10.88	1.09	1.04	0.80	1.14	0.94	0.70
Ti II 323.452	10.71	1.05	1.05	0.77	1.10	0.93	0.70
Ti II 334.941	10.58	1.03	1.04	0.78	1.13	0.95	0.70
Ti II 336.121	10.54	1.03	1.04	0.78	1.13	0.94	0.70
Tl II 132.171	15.49	2.13	1.03	1.36	2.68	0.00	0.72
Tl II 190.864	12.60	LR	1.02	LR	LR	LR	LR
Tl I 276.787	4.48	1.06	0.95	0.79	1.27	1.04	0.81
V II 292.402	11.38	1.14	1.04	0.85	1.26	0.94	0.71
V II 292.464	11.35	1.13	1.03	0.84	1.25	0.95	0.71
V II 309.311	11.15	1.13	1.05	0.84	1.23	0.95	0.70
V II 311.071	11.08	1.10	1.05	0.82	1.20	0.93	0.70
Zn II 202.548	15.51	1.81	1.05	1.23	2.10	0.91	0.69
Zn II 206.191	15.40	1.78	1.05	1.21	2.04	0.91	0.69
Zn I 213.856	5.80	1.28	1.01	0.94	1.41	0.93	0.77
Zn I 334.502	7.78	1.25	1.00	0.97	1.40	0.91	0.72



Analog to digital converter and supply voltage filtering		HV PSU data logger	
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I2C level shifter (5V <-> 3.3V)
and digital isolator

HV PSU data logger
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