APPENDICES

APPENDEX A

Linearity plots

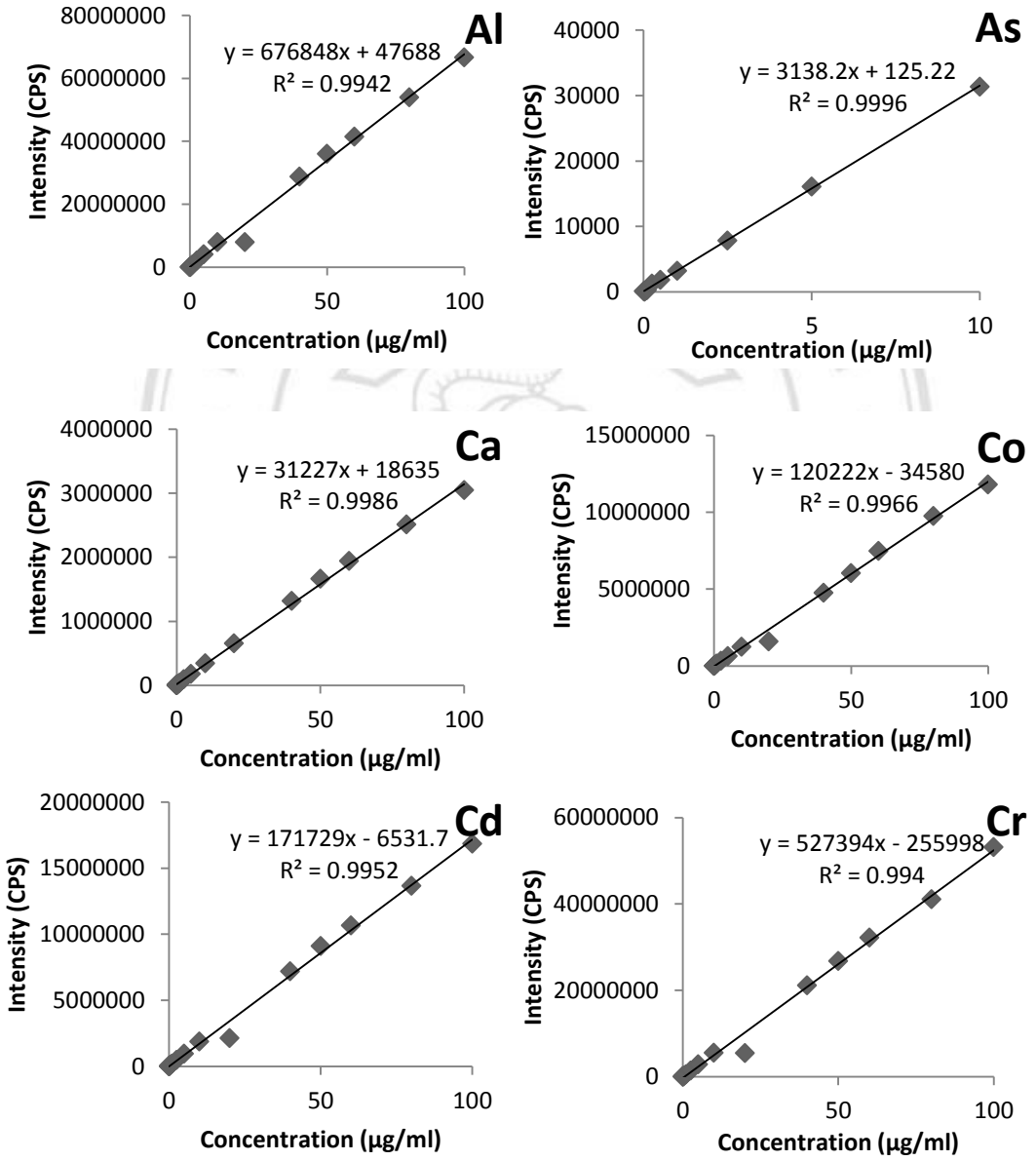


Figure A.1 Linearity graphs for all elements

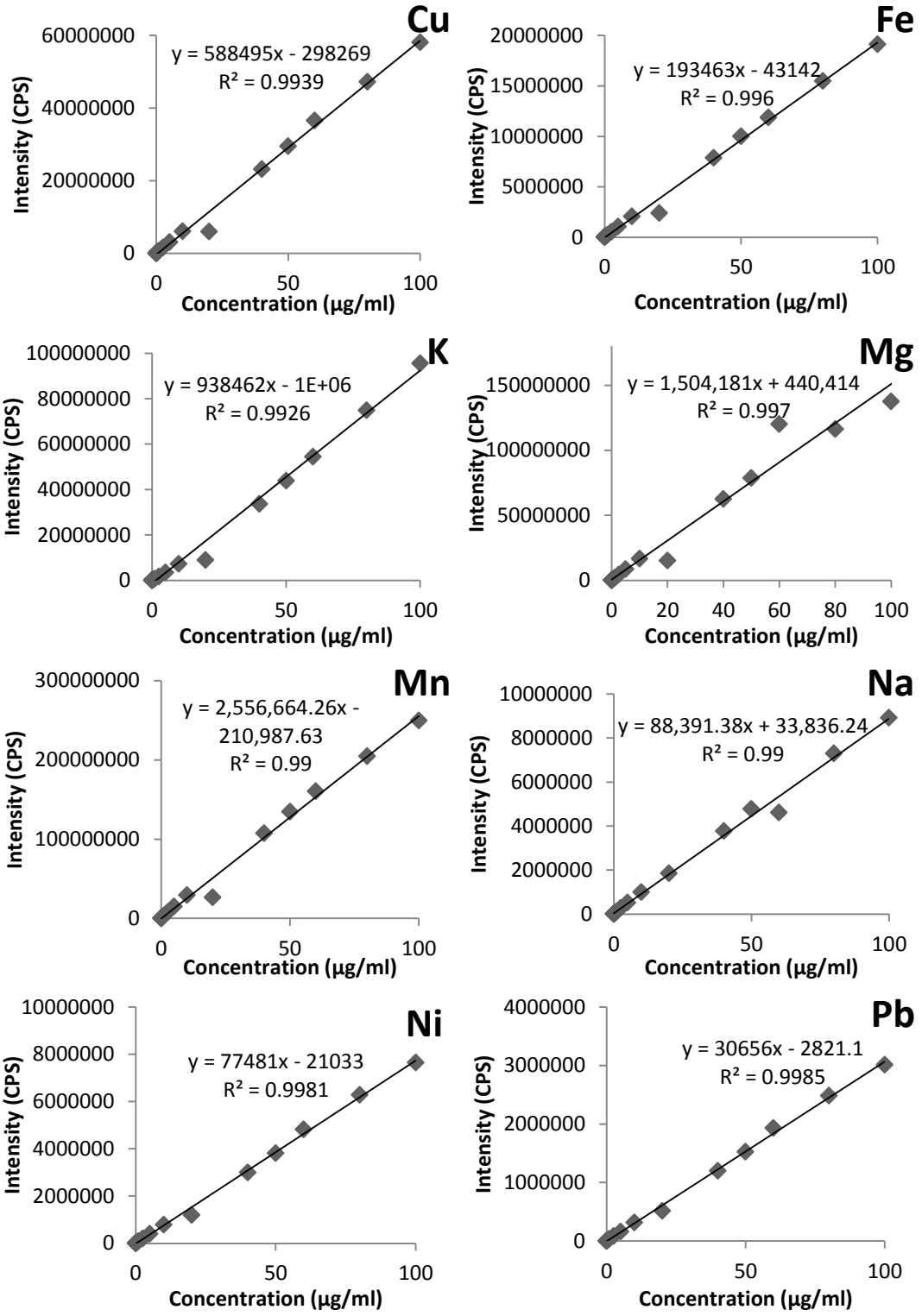


Figure A.1 Continued

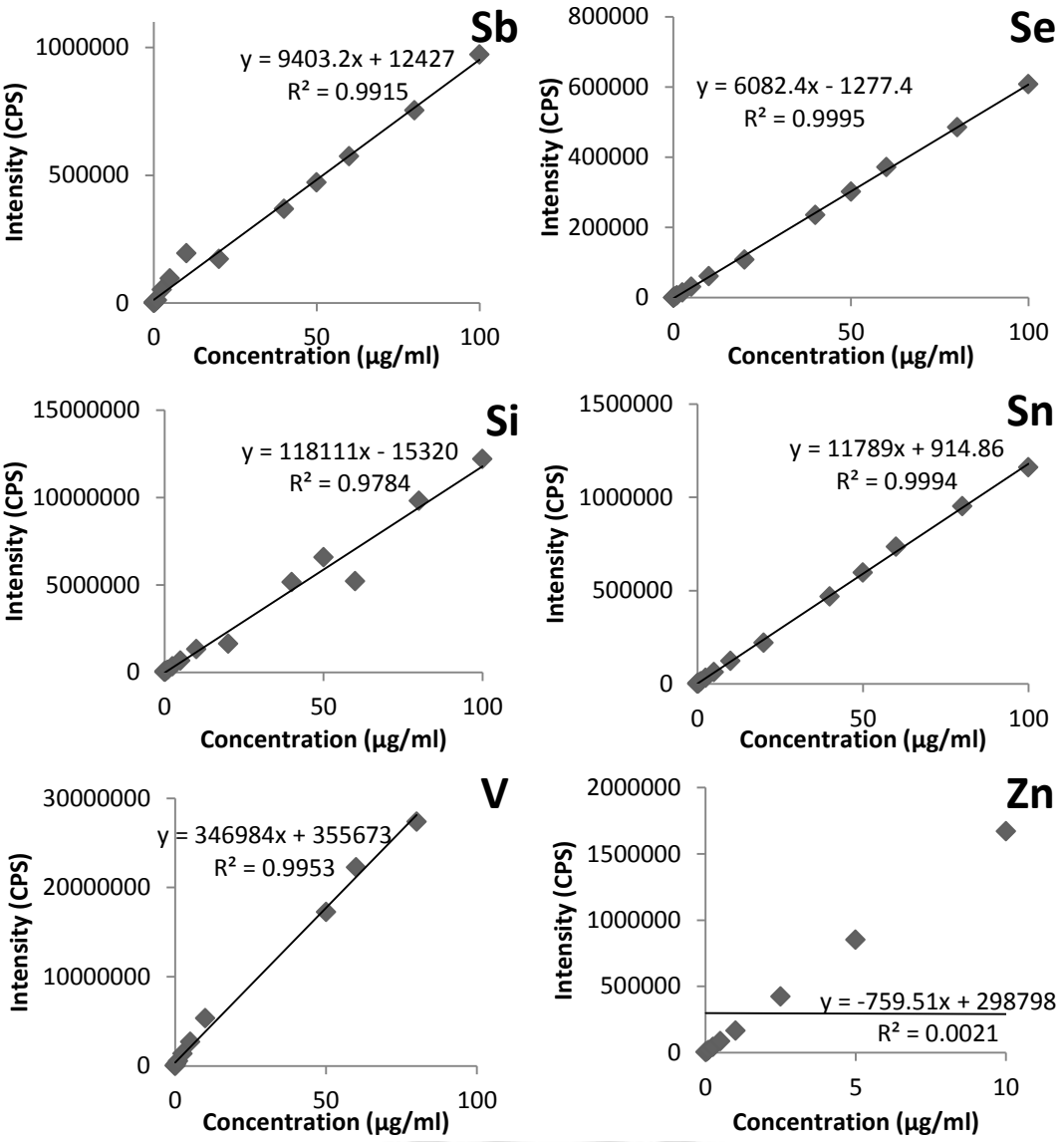
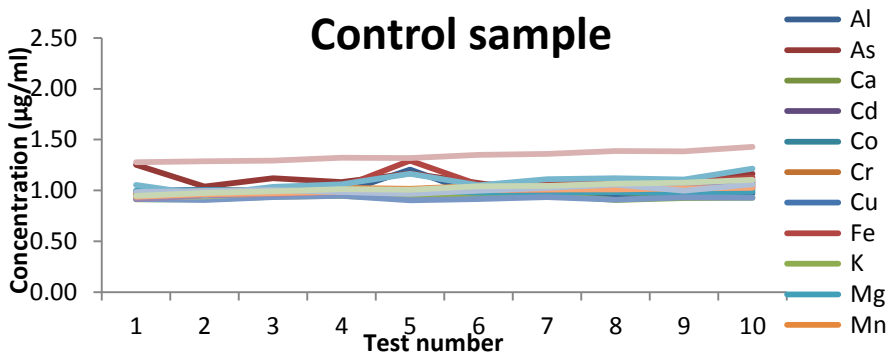


Figure A.1 Continued



FigureA.2 Control sample plot for signal stability check during the ICP-OES test

APPENDEX B

Calibration curve

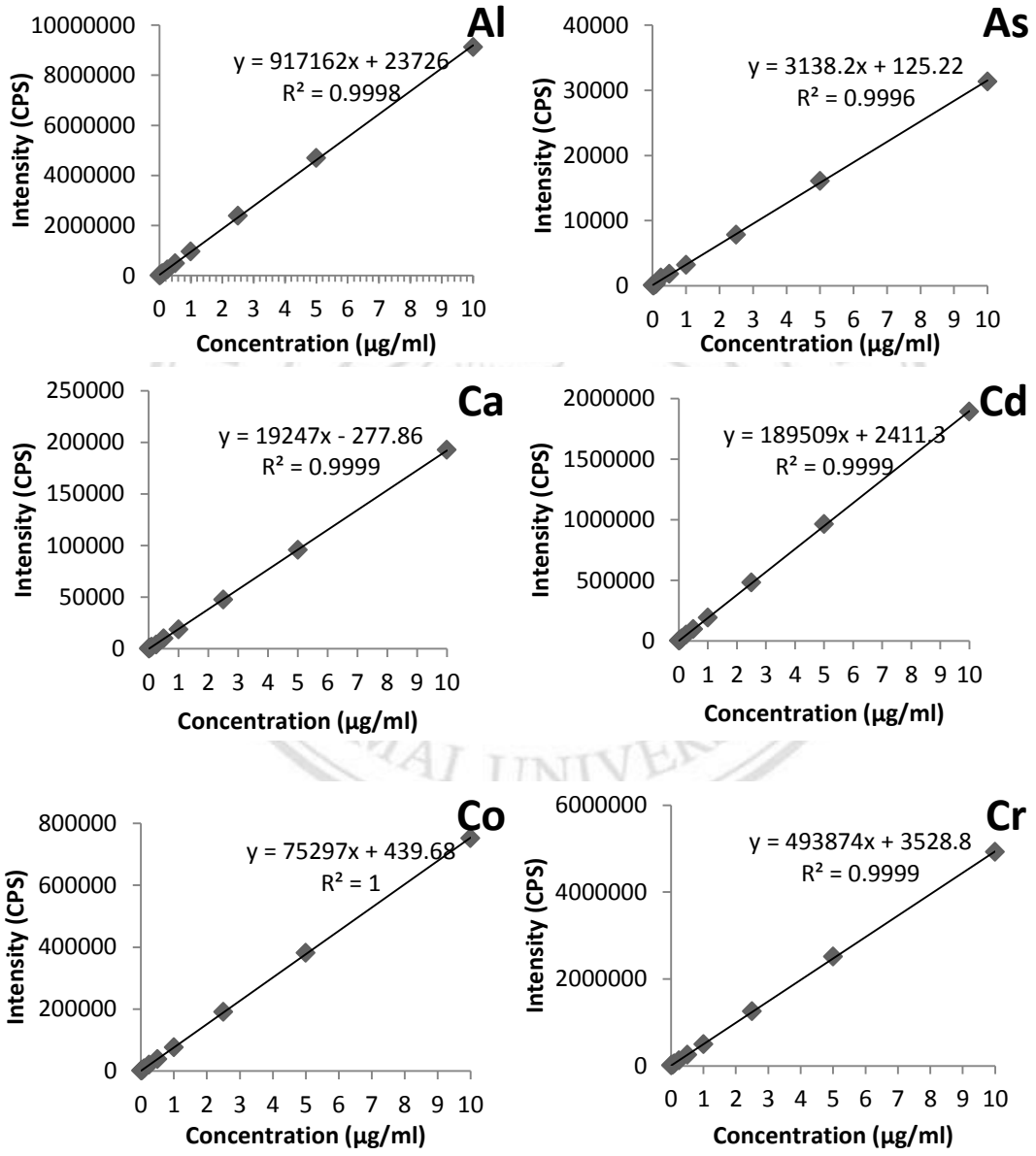


Figure B.1 Calibration for all elements

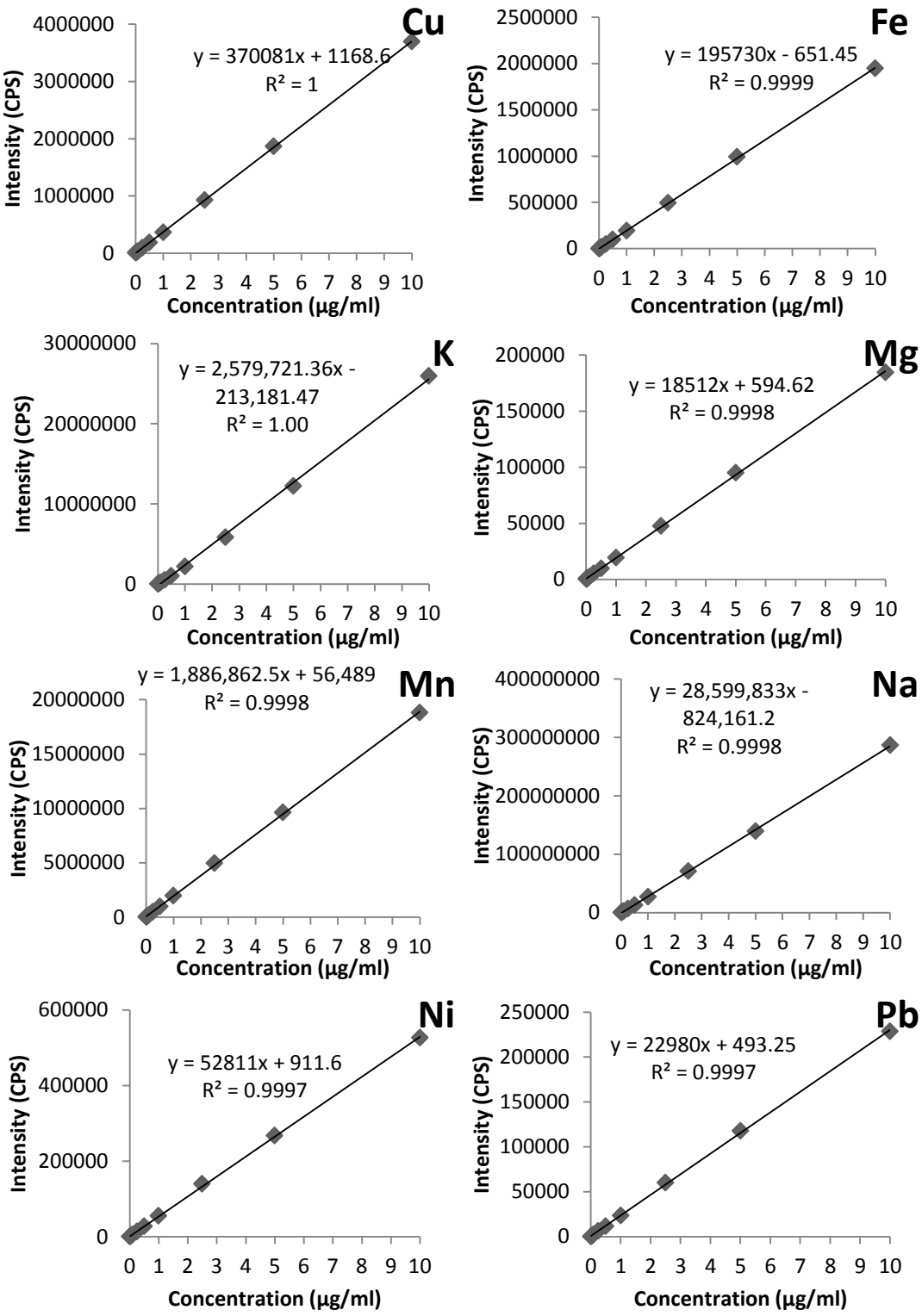


Figure B.1 Continued

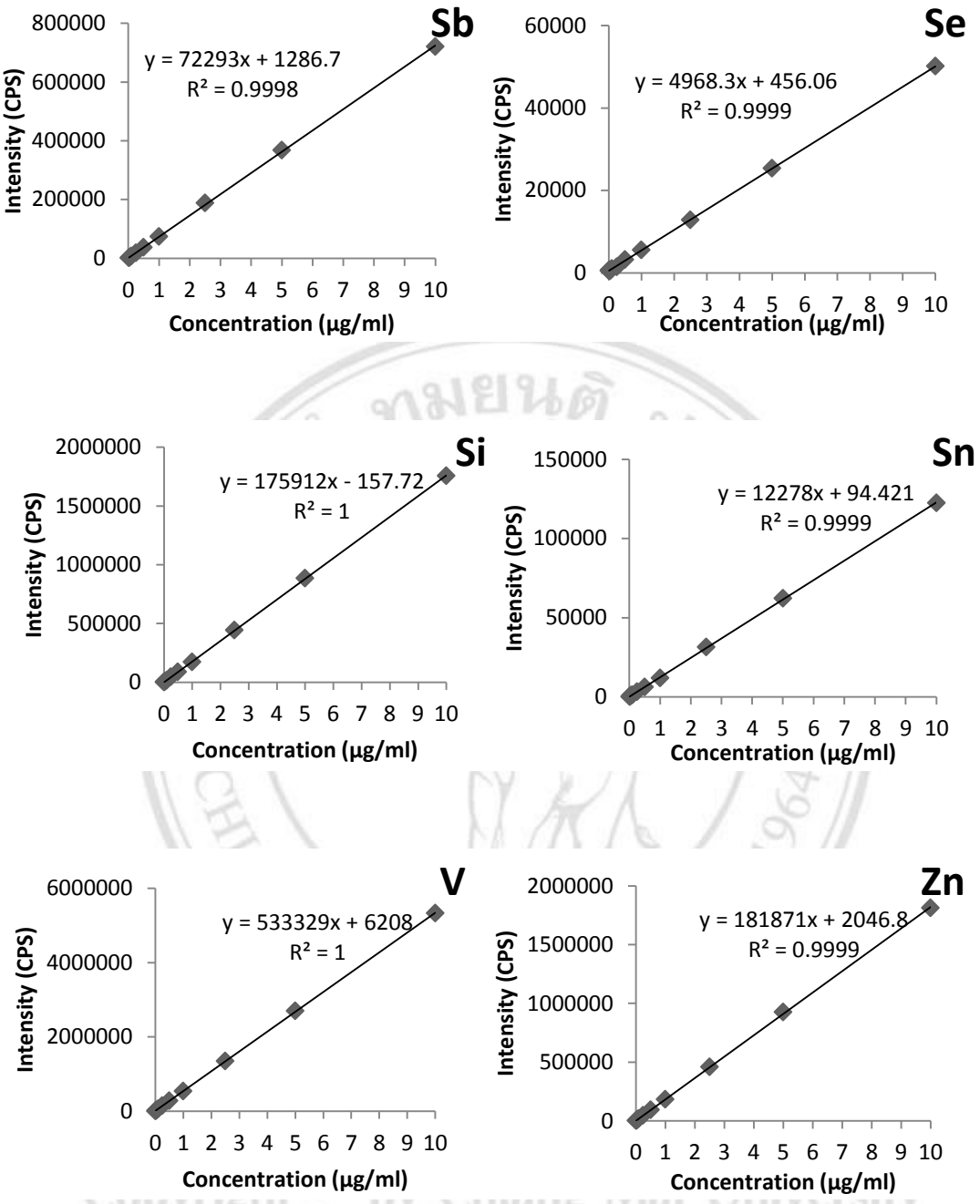


Figure B.1 Continued

APPENDEX C

Table C.1 Repeatability test from 1(μg/ml) of mixed standards

Element	Concentration (μg/ml)											
	1	2	3	4	5	6	7	8	9	10	Average	% RSD
Al	0.91	0.92	0.93	0.92	0.92	0.92	0.92	0.91	0.91	0.85	0.91±0.02	2.47
Ca	0.81	0.82	0.80	0.79	0.80	0.81	0.79	0.80	0.78	0.80	0.80±0.01	1.28
Cd	0.86	0.87	0.87	0.87	0.86	0.87	0.86	0.85	0.85	0.83	0.86±0.01	1.42
Co	0.90	0.91	0.91	0.91	0.90	0.91	0.90	0.90	0.89	0.87	0.90±0.01	1.29
Cr	0.77	0.77	0.78	0.77	0.77	0.77	0.77	0.77	0.76	0.75	0.77±0.01	1.09
Cu	0.90	0.90	0.91	0.91	0.90	0.90	0.90	0.90	0.89	0.85	0.90±0.02	1.82
Fe	0.88	0.89	0.90	0.89	0.89	0.89	0.88	0.89	0.88	0.87	0.88±0.01	0.97
K	1.14	1.14	1.14	1.17	1.17	1.18	1.19	1.20	1.20	1.15	1.17±0.02	2.01
Mg	0.80	0.79	0.80	0.79	0.79	0.80	0.78	0.79	0.78	0.77	0.79±0.01	1.34
Mn	0.97	0.98	0.98	0.98	0.97	0.98	0.97	0.97	0.97	0.87	0.96±0.03	3.49
Na	0.84	0.84	0.84	0.84	0.84	0.84	0.82	0.84	0.82	0.81	0.83±0.01	1.42
Ni	0.97	0.97	0.98	0.97	0.97	0.98	0.97	0.97	0.96	0.95	0.97±0.01	0.98
Pb	0.87	0.87	0.87	0.87	0.87	0.85	0.86	0.85	0.85	0.83	0.86±0.01	1.73
Sb	0.52	0.52	0.51	0.51	0.51	0.51	0.51	0.49	0.50	0.49	0.51±0.01	2.03
Se	0.97	1.05	1.05		1.04	1.07	1.02	1.01	1.02	1.01	1.03±0.03	2.65
Si	0.66	0.63	0.63	0.61	0.60	0.59	0.57	0.56	0.54	0.51	0.59±0.05	7.98
Sn	0.90	0.92	0.94	0.93	0.92	0.93	0.91	0.91	0.90	0.88	0.91±0.02	2.00
V	1.33	1.29	1.28	1.23	1.21	1.19	1.12	1.16	1.19	1.21	1.22±0.06	4.27
Zn	0.97	0.98	0.98	0.98	0.97	0.98	0.97	0.97	0.97	0.94	0.97±0.01	1.15

Table C.2 Repeatability test from 5 (μg/ml) of mixed standards

Element	Repeatability of instrument from 5 ppm std										Average	% RSD
	1	2	3	4	5	6	7	8	9	10		
Al	5.1	5.1	5.1	5.1	5.1	5.0	5.1	5.1	5.0	5.0	5.1±0.03	0.65
Ca	4.3	4.5	4.4	4.4	4.3	4.3	4.3	4.3	4.3	4.3	4.3±0.03	0.67
Cd	4.23	4.25	4.29	4.27	4.23	4.17	4.24	4.22	4.20	4.20	4.2±0.04	0.85
Co	4.34	4.35	4.38	4.36	4.33	4.28	4.34	4.31	4.30	4.30	4.3±0.03	0.75
Cr	3.76	3.78	3.81	3.79	3.77	3.72	3.77	3.76	3.74	3.74	3.8±0.03	0.70
Cu	4.36	4.38	4.41	4.40	4.36	4.31	4.36	4.35	4.34	4.33	4.4±0.03	0.70
Fe	4.42	4.44	4.48	4.46	4.42	4.37	4.44	4.42	4.40	4.39	4.4±0.03	0.72
K	7.34	7.41	7.46	7.42	7.42	7.41	7.42	7.42	7.40	7.40	7.4±0.03	0.41
Mg	4.27	4.29	4.28	4.31	4.26	4.22	4.24	4.27	4.24	4.23	4.3±0.03	0.66
Mn	4.73	4.75	4.79	4.77	4.74	4.71	4.76	4.75	4.73	4.73	4.7±0.02	0.48
Na	4.13	4.18	4.16	4.17	4.14	4.07	4.10	4.13	4.11	4.08	4.1±0.04	0.87
Ni	4.65	4.67	4.71	4.71	4.67	4.63	4.69	4.67	4.65	4.63	4.8±0.03	0.59
Pb	4.15	4.15	4.19	4.17	4.13	4.07	4.13	4.11	4.09	4.08	4.1±0.04	0.92
Sb	4.51	4.54	4.57	4.55	4.53	4.47	4.55	4.52	4.50	4.49	4.5±0.04	0.69
Si	5.37	5.38	5.40	5.42	5.35	5.25	5.35	5.32	5.30	5.27	5.3±0.05	0.10
Zn	4.78	4.79	4.83	4.81	4.13	4.76	4.81	4.78	4.12	4.81	4.7±0.28	6.06

Table C.3 EFs of elements in composition of $PM_{2.5}$ emitted from agricultural biomass.

	EF of elements (mg/kg $_{\text{Dry-biomass}}$)									
	Ca	Cd	Cr	K	Mg	Na	Sb	Si	Sn	Zn
RS1	ND	ND	4.59	284.05	13.84	54.55	5.91	ND	4.43	0.34
	ND	ND	5.92	548.37	8.60	39.93	7.63	ND	2.63	2.88
	3.83	ND	6.00	469.93	9.17	44.43	7.63	ND	2.27	4.42
RS2	ND	ND	4.42	332.03	8.51	35.99	6.46	ND	2.46	0.22
	55.57	ND	ND	440.23	32.03	82.94	0.53	1.28	1.34	1.59
	ND	ND	ND	355.63	5.25	25.67	0.00	ND	4.05	1.13
RS3	21.35	ND	ND	753.00	16.30	48.72	0.00	0.04	1.11	1.53
	ND	ND	ND	658.57	0.00	10.62	0.00	ND	1.75	1.30
	21.10	ND	ND	601.01	15.95	49.97	0.00	ND	3.74	2.78
RS4	ND	ND	4.08	185.96	9.11	36.81	5.60	0.67	2.48	1.03
	ND	ND	4.52	204.55	5.90	30.03	5.98	0.36	2.27	2.11
	ND	ND	3.83	187.63	9.50	33.81	5.76	ND	2.90	1.62
RS5	ND	ND	ND	902.29	4.37	20.85	0.01	ND	2.02	1.79
	ND	ND	ND	729.48	2.96	19.88	0.00	0.06	2.60	0.45
	ND	ND	ND	913.85	7.74	30.59	0.00	ND	3.74	0.83
MR1	ND	2.47	6.70	306.59	10.98	38.97	8.90	0.20	2.97	1.20
	ND	3.97	7.08	325.66	1.85	28.57	8.78	0.08	3.56	0.24
	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MR2	ND	1.30	5.25	255.19	11.56	51.77	7.12	0.14	3.03	0.00
	ND	2.44	5.90	253.84	16.23	63.57	7.69	0.45	1.06	2.05
	ND	3.67	4.16	226.81	ND	ND	5.92	0.26	1.83	0.67
MR3	ND	1.03	4.20	237.61	ND	23.17	5.54	0.51	2.27	0.19
	ND	1.43	3.70	218.83	12.15	43.15	4.94	0.21	2.75	1.78
	ND	2.96	5.60	252.77	2.74	33.52	7.43	1.26	3.49	0.07
MR4	ND	2.59	3.48	205.64	ND	0.30	4.90	0.25	1.40	0.37
	ND	0.51	3.26	184.67	ND	3.66	4.77	0.18	1.73	1.15
	ND	4.61	2.52	201.46	ND	0.00	3.97	0.81	2.20	1.37
MR5	ND	2.85	4.69	694.49	0.64	27.38	5.95	0.40	3.43	0.17
	ND	1.72	4.05	532.89	ND	10.66	5.49	0.51	2.28	0.51
	ND	2.35	3.54	685.45	13.12	45.78	5.07	0.32	3.05	0.84

Table C.4 details of EFs of elements in composition of $PM_{2.5}$ from forest biomass

	EF of elements (mg/kg $_{Dry\text{-}biomass}$)								
	Ca	Cr	K	Mg	Na	Si	Sb	Sn	Zn
DDF1	ND	5.87	224.94	ND	17.91	ND	7.25	1.99	2.35
	ND	3.64	181.67	ND	18.74	0.05	5.14	1.21	0.63
	ND	1.92	226.99	1.73	19.00	0.20	3.58	2.96	1.60
DDF2	ND	1.32	186.99	ND	ND	ND	2.66	3.06	1.19
	ND	4.63	224.64	2.94	28.38	ND	5.88	2.03	1.55
	ND	3.92	193.85	7.62	44.29	ND	5.40	3.64	1.07
DDF3	ND	3.49	238.60	ND	8.72	ND	4.88	2.65	2.89
	ND	1.17	191.70	ND	ND	ND	2.14	2.04	3.34
	ND	1.57	185.24	1.14	1.00	ND	2.87	1.55	1.12
DDF4	ND	4.57	253.10	12.04	53.42	ND	6.01	1.04	2.21
	ND	4.41	243.39	7.20	45.51	ND	6.11	2.29	5.81
	ND	2.94	216.10	0.46	12.36	ND	4.04	1.63	1.62
DDF5	ND	4.56	216.99	ND	22.78	0.46	5.91	1.05	1.38
	ND	0.74	180.80	ND	ND	ND	2.26	1.66	0.80
	ND	1.53	196.57	ND	ND	ND	3.11	1.46	1.42
MDF1	19.54	3.97	226.17	11.23	48.93	0.03	5.24	ND	2.40
	4.69	4.97	270.96	9.34	47.58	0.46	6.54	ND	3.04
	ND	5.66	276.56	5.46	37.97	0.17	7.63	ND	3.49
MDF2	ND	4.04	296.79	6.15	35.28	ND	5.29	ND	1.95
	ND	2.42	175.11	1.41	17.17	ND	3.18	ND	1.52
	2.72	2.46	160.85	5.30	28.76	ND	3.50	ND	1.96
MDF3	4.05	0.21	435.22	11.86	42.29	ND	1.29	ND	6.72
	ND	4.78	447.79	ND	27.29	0.33	6.42	ND	6.89
	ND	ND	284.25	11.79	ND	ND	0.80	ND	5.05
MDF4	ND	ND	228.96	4.75	25.78	ND	6.20	ND	2.01
	ND	ND	288.62	0.08	18.59	0.38	ND	ND	2.69
	ND	4.36	268.74	1.70	28.51	ND	6.31	ND	2.18
MDF5	ND	3.95	221.50	13.92	56.33	ND	5.89	ND	2.55
	ND	ND	257.71	10.30	36.67	ND	0.94	ND	6.16
	ND	ND	240.62	0.21	19.59	0.17	ND	ND	3.91

Table C.5 Details of EFs of elements in composition of Ash samples of agricultural biomass (RS burning).

	EF of elements (mg/kg $_{\text{Dry biomass}}$)																
	Al	As	Ca	Co	Cr	Cu	Fe	K	Mg	Mn	Na	Pb	Sb	Si	Sn	V	Zn
RS1	420.2	5.1	3646.4	6.6		4.1	1098.4	13255.0	1641.1	1127.0	111.2	10.7		2.5	7.0	2.0	38.2
	491.4	1.9	4211.3	3.9	2.5	3.1	813.8	15288.3	1907.0	1289.1	123.6	15.8	2.1	2.1	5.6	1.4	40.7
	531.0	4.4	4400.2	4.2	1.6	3.0	844.7	16232.1	2012.1	1363.4	126.4	13.1	1.2	2.2	6.2	1.0	40.8
Mean	480.9	3.8	4086.0	4.9	2.0	3.4	919.0	14925.2	1853.4	1259.8	120.4	13.2	1.6	2.3	6.3	1.5	39.9
SD	56.1	1.7	392.2	1.5	0.6	0.6	156.1	1521.4	191.2	120.9	8.1	2.5	0.7	0.2	0.7	0.5	1.5
RS2	1162.2	1.7	3467.7	5.1	2.1	1.8	1089.3	8567.8	1784.1	666.1	111.2	13.3	2.0	3.6	4.5	2.9	40.8
	1386.4	5.1	3871.8	5.0	2.2	1.7	1305.2	9799.7	1981.3	756.6	110.0	13.7	2.2	3.8	5.1	3.0	41.2
	1414.8	4.2	4004.2	5.7	2.5	2.0	1323.3	10000.1	2064.7	776.1	127.7	14.7	2.3	4.3	5.8	3.3	47.3
Mean	1321.1	3.7	3781.2	5.3	2.3	1.9	1239.3	9455.9	1943.4	732.9	116.3	13.9	2.1	3.9	5.1	3.1	43.1
SD	138.4	1.8	279.5	0.4	0.2	0.1	130.2	775.6	144.1	58.7	9.9	0.7	0.2	0.3	0.6	0.2	3.6
RS3	222.3	1.8	4257.7	1.2	1.1	2.8	261.2	14308.7	1558.9	2366.2	40.0	1.6	0.4	1.2	5.0	0.4	44.8
	213.1	6.6	4317.9	1.2	1.0	2.6	255.7	14320.0	1583.5	2393.4	38.4	2.3	0.3	1.2	4.5	0.5	44.2
	204.0	3.1	4138.4	0.8	1.0	2.6	234.5	13619.4	1487.9	2287.8	37.2	1.8	0.4	1.3	4.9	0.4	43.8
Mean	480.9	3.8	4086.0	4.9	2.0	3.4	919.0	14925.2	1853.4	1259.8	120.4	13.2	1.6	2.3	6.3	1.5	39.9
SD	56.1	1.7	392.2	1.5	0.6	0.6	156.1	1521.4	191.2	120.9	8.1	2.5	0.7	0.2	0.7	0.5	1.5
RS4	862.2	3.0	4477.0	5.8	2.0	2.2	1256.3	3358.3	1886.1	702.6	73.8	3.5	1.9	3.0	4.9	2.6	37.9
	1034.9	4.5	5170.8	6.6	2.3	2.4	1496.4	3892.5	2199.3	813.9	84.0	3.2	2.0	3.9	5.0	3.2	44.5

Table C.5 Continued

	EF of elements (mg/kg $_{\text{Dry biomass}}$)																
	Al	As	Ca	Co	Cr	Cu	Fe	K	Mg	Mn	Na	Pb	Sb	Si	Sn	V	Zn
	936.6	4.4	4939.5	5.8	2.2	2.5	1359.4	3705.2	2087.3	769.8	80.2	1.6	2.2	3.5	4.9	2.9	42.4
Mean	944.6	4.0	4862.4	6.1	2.2	2.4	1370.7	3652.0	2057.6	762.1	79.3	2.8	2.1	3.5	4.9	2.9	41.6
SD	86.7	0.9	353.3	0.5	0.2	0.2	120.5	271.1	158.7	56.1	5.2	1.0	0.2	0.5	0.1	0.3	3.3
	718.8	4.6	4859.7	2.2	1.7	1.0	514.7	12050.6	2006.7	676.9	263.1	6.3	1.5	2.2	4.0	1.6	24.8
RS5	645.3	2.3	5091.4	2.0	1.5	1.2	453.5	12648.2	2106.2	708.0	278.2	6.7	1.3	2.3	4.5	1.3	25.7
	709.4	3.8	4624.9	2.2	1.7	1.0	525.8	11508.2	1920.1	647.4	256.3	3.9	1.3	2.3	4.4	1.5	23.9
Mean	691.2	3.6	4858.7	2.2	1.6	1.0	498.0	12069.0	2011.0	677.4	265.9	5.6	1.4	2.2	4.3	1.5	24.8
SD	40.0	1.2	233.3	0.1	0.1	0.1	39.0	570.2	93.1	30.3	11.2	1.5	0.1	0.0	0.3	0.2	0.9

Table C.6 Details of EFs of elements in composition of Ash samples of agricultural biomass (MR burning)

	EF of elements (mg/kg $_{\text{Dry biomass}}$)														
	Al	Ca	Co	Cr	Cu	Fe	K	Mg	Mn	Na	Pb	Sb	Si	V	Zn
	159.3	2466.1	0.7	0.4	6.7	193.8	15197.9	2148.9	126.3	1.5	3.9	0.2	0.6	0.1	6.9
MR1	135.9	2125.1	0.7	0.3	5.9	161.6	13041.3	1852.8	107.1	1.2	4.6	0.2	0.4	0.1	6.4
	143.8	2236.6	0.7	0.3	6.2	176.3	13706.7	1954.3	115.0	1.2	3.9	0.1	0.4	0.0	6.4
Mean	146.3	2276.0	0.7	0.3	6.3	177.2	13982.0	1985.4	116.1	1.3	4.1	0.2	0.5	0.1	6.6
SD	11.9	173.9	0.0	0.1	0.4	16.1	1104.3	150.5	9.6	0.2	0.4	0.0	0.1	0.0	0.3
	728.1	1467.8	3.1	0.7	4.3	758.9	14075.2	1885.5	101.4	5.7	5.5	0.6	1.9	1.1	7.9
MR2	555.5	1217.4	2.4	0.5	3.6	574.9	11848.8	1579.5	83.8	4.3	3.9	0.4	1.4	0.8	6.6
	534.0	1047.9	2.3	0.5	3.2	551.2	10340.1	1395.1	73.3	3.7	3.2	0.4	1.4	0.8	5.5
Mean	605.9	1244.4	2.6	0.6	3.7	628.4	12088.0	1620.1	86.1	4.6	4.2	0.5	1.6	0.9	6.7
SD	106.4	211.2	0.5	0.1	0.5	113.7	1879.0	247.7	14.2	1.0	1.2	0.1	0.3	0.2	1.2
	311.8	3428.3	1.5	0.5	7.1	361.2	19417.1	1505.3	57.3	2.9	3.6	0.4	1.1	0.4	8.1
MR3	410.1	3941.3	2.2	0.7	8.6	499.0	22526.4	1730.7	68.5	2.3	7.2	0.6	1.4	0.5	10.4
	369.3	3653.3	2.1	0.7	7.4	465.6	20723.9	1578.9	62.7	6.8	6.6	0.6	1.2	0.5	13.3
Mean	363.7	3674.3	1.9	0.6	7.7	441.9	20889.1	1605.0	62.8	4.0	5.8	0.5	1.2	0.5	10.6
SD	49.4	257.2	0.4	0.1	0.8	71.9	1561.2	115.0	5.6	2.5	1.9	0.1	0.1	0.1	2.6

Table C.6 Continued

	EF of elements (mg/kg $_{\text{Dry biomass}}$)														
	Al	Ca	Co	Cr	Cu	Fe	K	Mg	Mn	Na	Pb	Sb	Si	V	Zn
MR4	153.2	4973.9	0.8	0.3	8.6	195.4	3452.8	3286.6	117.0	4.4	1.8	0.2	0.6	0.1	13.0
	209.3	4629.1	1.1	0.3	8.1	254.7	3195.4	2986.0	109.1	1.3	2.1	0.2	0.7	0.1	9.8
	250.8	5495.5	1.1	0.6	4.4	313.5	3768.4	3541.4	128.2	3.1	1.4	0.5	1.1	0.4	5.4
Mean	204.4	5032.8	1.0	0.4	7.1	254.6	3472.2	3271.3	118.1	2.9	1.7	0.3	0.8	0.2	9.4
SD	49.0	436.2	0.1	0.2	2.3	59.1	287.0	278.1	9.6	1.6	0.3	0.2	0.3	0.2	3.8
MR5	315.1	2122.7	1.0	0.6	3.9	214.1	17102.4	1078.7	97.8	2.7	1.0	0.4	0.9	0.4	4.5
	201.4	1255.3	1.1	0.4	8.7	132.8	9908.5	641.6	52.3	1.2	2.3	0.2	0.8	0.2	10.6
	367.7	2220.1	1.1	0.6	3.9	248.2	18282.1	1128.2	103.7	2.7	1.5	0.5	1.0	0.4	4.7
Mean	294.7	1866.0	1.0	0.5	5.5	198.4	15097.6	949.5	84.6	2.2	1.6	0.4	0.9	0.3	6.6
SD	85.0	531.2	0.1	0.1	2.8	59.3	4532.5	267.8	28.1	0.9	0.6	0.1	0.1	0.1	3.4

Table C.7 Details of EFs of elements in composition of Ash samples of forest biomass (DDF Burning)

	EF of elements (mg/kg $_{\text{Dry Biomass}}$)															
	Al	Ca	Co	Cr	Cu	Fe	K	Mg	Mn	Na	Ni	Pb	Sb	Si	V	Zn
	746.8	10608.3	4.9	2.2	5.4	997.6	4235.3	3729.7	771.3	8.3	4.6	12.0	1.8	1.9	1.6	14.0
DDF1	1061.9	14959.1	7.5	3.2	7.8	1529.4	5813.1	5232.1	1073.1	11.5	6.6	20.6	2.6	3.1	2.4	20.7
	674.7	9538.2	4.9	2.1	5.0	965.2	3684.4	3334.4	682.2	7.8	4.3	14.1	1.7	1.9	1.4	13.6
Mean	827.8	11701.9	5.7	2.5	6.1	1164.1	4577.6	4098.7	842.2	9.2	5.2	15.6	2.0	2.3	1.8	16.1
SD	206.0	2871.1	1.5	0.6	1.5	316.8	1104.8	1001.2	204.8	2.0	1.3	4.5	0.5	0.7	0.5	4.0
	1500.4	9079.0	6.4	5.1	6.7	1092.7	5041.3	4379.4	1233.3	9.6	3.4	7.0	4.3	3.2	2.4	16.3
DDF2	1062.6	5775.1	4.3	2.8	4.1	769.5	3261.5	2793.2	795.9	6.2	2.1	4.3	2.3	2.0	1.4	10.8
	1467.0	8759.1	4.7	3.3	4.8	1073.5	5045.4	4255.0	1196.8	6.7	2.5	6.0	2.9	2.3	1.5	11.7
Mean	1343.3	7871.0	5.1	3.7	5.2	978.5	4449.4	3809.2	1075.3	7.5	2.7	5.8	3.2	2.5	1.8	13.0
SD	243.7	1822.2	1.2	1.2	1.3	181.3	1028.8	882.1	242.7	1.8	0.7	1.4	1.0	0.6	0.6	3.0
	275.3	11271.8	1.3	0.9	6.8	236.0	3572.8	2363.2	1187.7	8.4	7.5	3.6	0.3	0.9	0.4	14.3
DDF3	336.1	14166.6	1.6	1.1	9.1	285.4	4438.8	2960.4	1487.1	10.9	10.3	5.5	0.5	1.0	0.5	19.2
	475.8	20169.7	2.0	1.4	11.4	371.8	6399.1	4237.0	2104.2	14.5	12.6	9.4	0.6	1.2	0.6	24.7
Mean	362.4	15202.7	1.6	1.1	9.1	297.7	4803.6	3186.9	1593.0	11.3	10.2	6.2	0.5	1.0	0.5	19.4
SD	102.8	4538.6	0.3	0.2	2.3	68.8	1448.0	957.2	467.3	3.0	2.6	3.0	0.1	0.1	0.1	5.2

Table C.7 continued

	EF of elements (mg/kg $_{\text{Dry Biomass}}$)															
	Al	Ca	Co	Cr	Cu	Fe	K	Mg	Mn	Na	Ni	Pb	Sb	Si	V	Zn
	497.8	9042.0	2.9	0.8	4.5	403.1	2259.8	1883.5	354.0	5.9	1.7	2.3	0.5	1.2	0.6	9.7
DDF4	653.5	12781.9	4.2	1.1	6.8	522.3	3174.0	2660.4	499.8	8.5	2.7	2.3	0.7	2.1	0.8	14.2
	899.1	17613.5	5.4	1.5	8.8	759.4	4355.7	3672.6	695.0	11.4	3.4	3.6	1.2	1.8	1.1	18.7
Mean	683.4	13145.8	4.2	1.1	6.7	561.6	3263.2	2738.9	516.3	8.6	2.6	2.7	0.8	1.7	0.8	14.2
SD	202.3	4297.3	1.3	0.4	2.1	181.4	1050.8	897.1	171.1	2.8	0.9	0.8	0.4	0.5	0.3	4.5
	1498.0	27945.4	6.3	2.6	14.9	1430.1	4433.0	3012.6	697.8	8.7	5.2	3.8	2.1	5.0	3.9	22.0
DDF5	1028.0	17346.4	4.1	1.7	9.0	943.6	2649.2	1852.7	430.0	5.1	3.3	1.6	1.4	3.2	2.4	13.3
	1968.2	39615.7	8.9	3.9	20.6	1904.3	5589.6	4053.9	951.0	11.8	7.0	3.8	3.2	7.1	5.2	29.7
Mean	1498.1	28302.5	6.4	2.7	14.8	1426.0	4223.9	2973.1	693.0	8.5	5.2	3.0	2.3	5.1	3.8	21.7
SD	470.1	11138.9	2.4	1.1	5.8	480.4	1481.3	1101.2	260.5	3.4	1.9	1.3	0.9	2.0	1.4	8.2

Table C.8 Details of EFs of elements in composition of Ash samples of forest biomass (MDF Burning)

	EF of elements (mg/kg $_{\text{Dry biomass}}$)															
	Al	Ca	Co	Cr	Cu	Fe	K	Mg	Mn	Na	Ni	Pb	Sb	Si	V	Zn
	1322.3	22402.5	8.8	6.3	13.1	1870.4	3694.8	3884.0	149.7	10.2	12.6	1.4	6.1	5.7	4.4	22.7
MDF1	1298.9	22253.2	8.3	6.1	12.7	1788.7	3741.3	3873.9	146.8	10.1	12.6	1.1	5.9	5.7	4.1	22.5
	1379.5	24106.7	8.7	6.3	13.5	1902.3	3977.0	4190.6	160.6	10.7	13.7	1.4	6.1	5.8	4.3	24.4
Mean	1333.6	22920.8	8.6	6.3	13.1	1853.8	3804.4	3982.8	152.3	10.4	13.0	1.3	6.0	5.7	4.3	23.2
SD	41.5	1029.7	0.3	0.1	0.4	58.6	151.3	180.0	7.3	0.3	0.7	0.2	0.1	0.1	0.2	1.0
	1495.4	15535.5	2.7	0.9	13.9	523.5	7442.0	3312.6	235.8	8.7	0.5	8.1	0.6	1.4	0.5	19.2
MDF2	1577.9	16734.9	2.9	1.1	14.8	613.9	8022.5	3560.1	257.0	8.0	0.5	11.0	0.7	1.6	0.5	20.2
	1458.8	15258.2	2.4	0.9	13.7	508.4	7289.7	3255.7	228.1	7.3	0.4	9.3	0.6	1.3	0.5	18.3
Mean	1510.7	15842.9	2.7	0.9	14.1	548.6	7584.7	3376.2	240.3	8.0	0.4	9.5	0.7	1.4	0.5	19.2
SD	61.0	784.9	0.3	0.1	0.6	57.0	386.7	161.8	14.9	0.7	0.1	1.4	0.1	0.2	0.0	1.0
	1023.8	23676.3	7.1	2.5	11.0	1144.3	5645.5	3719.1	389.0	8.2	12.7	4.4	2.2	5.3	4.2	43.7
MDF3	1063.0	24737.8	7.2	2.5	11.6	1148.2	5874.8	3895.7	406.6	8.2	13.3	4.1	2.3	5.3	4.4	46.2
	969.0	22750.4	6.7	2.3	10.5	1071.5	5265.7	3570.9	370.2	7.6	12.0	4.3	2.2	4.9	4.0	42.1
Mean	1018.6	23721.5	7.0	2.4	11.0	1121.3	5595.3	3728.6	388.6	8.0	12.6	4.3	2.2	5.2	4.2	44.0
SD	47.2	994.5	0.3	0.1	0.6	43.2	307.6	162.6	18.2	0.3	0.6	0.2	0.1	0.2	0.2	2.1

Table C.8 continued

	EF of elements (mg/kg $_{\text{Dry Biomass}}$)															
	Al	Ca	Co	Cr	Cu	Fe	K	Mg	Mn	Na	Ni	Pb	Sb	Si	V	Zn
	876.9	18887.8	3.2	0.9	13.1	528.6	5321.9	3525.9	792.7	9.2	0.8	7.2	0.5	1.3	0.9	42.2
MDF4	793.0	17090.2	2.9	0.7	11.7	472.0	4715.1	3176.1	711.6	7.7	0.7	5.8	0.4	1.3	0.7	37.3
	767.2	15894.2	2.7	0.7	10.8	462.6	4421.2	2947.8	665.5	7.1	0.7	5.0	0.4	1.2	0.6	34.0
Mean	812.4	17290.7	2.9	0.8	11.9	487.7	4819.4	3216.6	723.3	8.0	0.7	6.0	0.4	1.3	0.7	37.8
SD	57.4	1506.8	0.3	0.2	1.2	35.7	459.3	291.2	64.4	1.1	0.0	1.1	0.1	0.1	0.1	4.1
	913.0	9971.5	3.0	1.6	6.7	584.6	2264.3	1238.1	93.2	4.4	1.5	6.1	1.4	2.6	1.9	14.7
MDF5	939.2	9874.2	2.8	1.8	6.5	549.7	2216.7	1202.3	87.2	3.9	1.3	4.3	1.6	2.9	1.9	14.3
	431.6	4459.1	2.7	1.4	5.9	249.2	1017.3	532.5	19.7	3.5	1.2	6.0	1.2	2.6	1.5	12.9
Mean	761.3	8101.6	2.8	1.6	6.4	461.1	1832.8	991.0	66.7	3.9	1.3	5.5	1.4	2.7	1.8	14.0
SD	285.8	3154.9	0.1	0.2	0.4	184.4	706.6	397.4	40.8	0.4	0.2	1.0	0.2	0.2	0.3	0.9

Table C.9 Correlation coefficient of EF of $PM_{2.5}$ and elements emitted from agricultural BB.

	RS Correlations							
	PM2.5	K	Mg	Na	Sb	Sn	Zn	Total
PM2.5	1							
K	0.550*	1						
Mg	0.061	-0.254	1					
Na	0.025	-0.236	0.946**	1				
Sb	-0.594*	-0.558*	0.207	0.323	1			
Sn	-0.354	-0.229	-0.018	0.041	-0.019	1		
Zn	-0.257	0.071	0.207	0.179	0.284	-0.25	1	
Total	0.346	.589*	0.257	0.389	0.054	-0.315	0.229	1

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Table C.9 Continued

	MR Correlations										
	PM2.5	Cd	Cr	K	Mg	Na	Sb	Si	Sn	Zn	Total
PM2.5	1										
Cd	0.022	1									
Cr	0.244	0.147	1								
K	0.864**	0.04	0.014	1							
Mg	0.221	-0.217	0.325	0.081	1						
Na	0.366	-0.232	0.555*	0.199	0.887**	1					
Sb	0.205	0.158	0.992**	-0.029	0.35	0.543*	1				
Si	-0.058	0.281	-0.116	-0.038	-0.231	-0.08	-0.104	1			
Sn	0.238	0.161	0.409	0.446	0.049	0.306	0.378	0.114	1		
Zn	-0.069	-0.017	-0.163	-0.246	0.511	0.22	-0.139	-0.115	-0.487	1	
Total	0.884**	0.014	0.106	0.988**	0.219	0.345	0.064	-0.052	0.476	-0.196	1

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Table C.10 Correlation coefficient of EF of $PM_{2.5}$ and elements emitted from Forest BB.

	DDF Correlations								
	PM2.5	Cr	K	Mg	Na	Sb	Sn	Zn	Total
PM2.5	1								
Cr	-0.061	1							
K	-0.439	.636*	1						
Mg	0.232	0.418	0.461	1					
Na	0.092	.818**	.632*	.758**	1				
Sb	-0.05	.961**	.679**	0.409	0.831**	1			
Sn	0.107	-0.189	0.061	0.128	-0.067	-0.182	1		
Zn	-0.571*	0.257	0.754**	0.143	0.177	0.3	0.175	1	
Total	-0.256	0.824**	.885**	.600*	0.840**	0.835**	0.084	0.549*	1

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Table C.10 Continued

	MDF Correlations							
	PM2.5	Cr	K	Mg	Na	Sb	Zn	Total
PM2.5	1							
Cr	-0.21	1						
K	0.08	0.04	1					
Mg	-0.21	-0.01	-0.01	1				
Na	-0.40	0.516*	0.05	0.51	1			
Sb	-0.16	0.847**	-0.01	0.03	0.50	1		
Zn	-0.10	-0.25	0.770**	0.19	-0.05	-0.32	1	
Total	-0.04	0.19	0.963**	0.16	0.30	0.14	0.726**	1

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Table C.11 Correlation coefficient of elements emitted from RS ash samples remained from BB

	Correlations																	
	Al	Ca	Co	Cr	Cu	Fe	K	Mg	Mn	Na	Pb	Sb	Si	V	Zn	Sn	As	Ash
Al	1																	
Ca	0.02	1																
Co	0.60*	-0.04	1															
Cr	0.79**	0.10	0.47	1														
Cu	-0.58*	-0.30	0.10	-0.27	1													
Fe	0.79**	0.04	0.92**	0.70**	-0.06	1												
K	-0.77**	-0.20	-0.60*	-0.50	0.54*	-.70**	1											
Mg	0.63**	0.61*	0.43	0.59*	-0.40	0.59*	-0.38	1										
Mn	-0.65**	-0.17	-0.30	-0.35	0.81**	-0.32	.668**	-0.38	1									
Na	0.34	0.18	0.08	0.24	-0.48	0.09	0.05	0.57*	-0.57*	1								
Pb	0.40	-0.48	0.26	0.42	-0.09	0.27	0.12	0.22	-0.26	0.62*	1							
Sb	0.84**	0.09	0.45	0.96**	-0.36	0.71**	-0.59*	0.62*	-0.42	0.23	0.38	1						
Si	0.90**	-0.06	0.80**	0.65**	-0.36	0.90**	-0.78**	0.58	-0.53*	0.23	0.36	0.70**	1					
V	0.91**	-0.03	0.82**	0.74**	-0.35	0.92**	-0.78**	0.57*	-0.51*	0.21	0.35	0.77**	0.94**	1				
Zn	0.06	-0.23	0.01	0.18	0.36	0.17	0.01	-0.09	0.62*	-0.58*	-0.23	0.18	0.12	0.12	1			
Sn	0.03	-0.45	0.44	0.16	0.66**	0.42	0.23	0.02	0.46	-0.09	0.42	0.10	0.27	0.20	0.37	1		
As	0.02	0.08	0.24	-0.16	0.03	0.20	0.03	0.17	0.18	-0.05	-0.04	-0.15	0.09	0.21	0.05	0.10	1	
Ash	0.10	-0.39	0.60**	0.26	0.67**	0.52*	0.15	0.13	0.40	-0.06	0.43	0.19	0.32	0.32	0.35	0.83**	0.22	1
$PM_{2.5}$	-0.21	-0.45	-0.63*	-0.41	-0.15	-0.56*	0.31	-0.51	0.19	-0.20	-0.08	-0.32	-0.33	-0.3	0.29	-0.26	-0.0	-0.3

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Table C.12 Correlation coefficient of elements emitted from MR ash samples remained from BB.

	Correlations															
	Al	Ca	Co	Cr	Cu	Fe	K	Mg	Mn	Na	Pb	Sb	Si	V	Zn	Ash
Al	1															
Ca	-0.41	1														
Co	0.94	-0.28	1													
Cr	0.69**	0.09	0.68**	1												
Cu	-0.54*	0.47	-0.28	-0.30	1											
Fe	0.94**	-0.22	0.98**	0.68**	-0.38	1										
K	0.28	-0.32	0.28	0.48	-0.04	0.24	1									
Mg	-0.30	0.79**	-0.22	-0.17	0.19	-0.09	-0.66**	1								
Mn	-0.34	0.31	-0.47	-0.32	-0.22	-0.32	-0.48	0.68**	1							
Na	0.64**	0.05	0.68**	0.60**	-0.22	0.70**	0.15	0.04	-0.22	1						
Pb	0.36	-0.11	0.57	0.36	0.24	0.55*	.588*	-0.18	-0.38	0.33	1					
Sb	0.73**	0.03	0.73**	0.99**	-0.29	0.72**	.530*	-0.22	- 0.39	0.64*	0.41	1				
Si	0.95**	-0.19	0.94**	0.81**	-0.42	0.94**	0.23	-0.18	-0.38	9.67**	0.35	0.84**	1			
V	0.98**	-0.37	0.94**	0.70**	-0.56*	0.94**	0.23	-0.25	-0.33	0.66**	0.33	**	0.96	1		
Zn	-0.14	0.41	0.14	-0.01	0.82**	0.04	-0.05	0.18	-0.35	0.34	0.38	0.02	-0.03	-0.15	1	
Ash	0.55**	0.24	0.66**	0.83**	0.17	0.60*	0.42	-0.14	-0.56*	0.48	0.44	0.85**	0.73**	0.55**	0.38	1
$PM_{2.5}$	0.00	-0.63*	-0.24	-0.10	-0.41	-0.29	0.35	-0.72**	-0.16	-0.28	-0.4	-0.09	-0.13	-0.05	-0.55*	-0.2

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table C.11 Correlation coefficient of elements emitted from DDF ash samples remained from BB.

	Correlations																
	Al	Ca	Co	Cr	Cu	Fe	K	Mg	Mn	Na	Ni	Pb	Sb	Si	V	Zn	Ash
Al	1																
Ca	0.51	1															
Co	0.85**	0.49	1														
Cr	0.85**	0.18	0.76**	1													
Cu	0.51	0.99**	0.45	0.22	1												
Fe	0.88**	0.57**	0.95**	0.76**	0.53*	1											
K	0.36	0.43	0.36	0.49	0.47	0.41	1										
Mg	0.42	0.17	0.55*	0.64*	0.19	0.53**	0.90**	1									
Mn	-0.13	0.08	-0.28	0.12	0.18	-0.19	0.76**	0.53**	1								
Na	0.00	0.49	0.14	0.08	0.54*	0.10	0.82**	0.64**	0.70**	1							
Ni	-0.29	0.39	-0.29	-0.20	0.46	-0.17	0.63**	0.30	0.81**	0.78**	1						
Pb	-0.05	-0.16	0.27	0.27	-0.18	0.31	0.50	0.69**	0.28	0.34	0.27	1					
Sb	0.87**	0.15	0.79**	0.99**	0.18	0.79**	0.41	0.60**	0.01	-0.01	-0.30	0.25	1				
Si	0.88**	0.79**	0.83**	0.63*	0.78**	0.89**	0.32	0.27	-0.19	0.13	-0.06	-0.06	0.64**	1			
V	0.88**	0.75**	0.85**	0.68**	0.74**	0.92**	0.32	0.29	-0.18	0.10	-0.07	0.00	0.68**	0.99**	1		
Zn	0.37	0.87**	0.42	0.25	0.90**	0.47	0.75**	0.50	0.47	.83**	0.68**	0.15	0.18	0.61**	0.57**	1	
Ash	0.77**	0.77**	0.83**	0.61*	0.77**	0.78**	0.62*	0.59**	0.08	0.55*	0.13	0.11	0.59*	.825**	0.80**	0.79**	1
$PM_{2.5}$	0.03	-0.29	-0.07	0.16	-0.28	-0.17	0.20	0.27	0.29	0.11	-0.09	0.02	0.14	-0.24	-0.27	-0.14	0.03

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table C.12 Correlation coefficient of elements emitted from MDF ash samples remained from BB.

	Correlations																
	Al	Ca	Co	Cr	Cu	Fe	K	Mg	Mn	Na	Ni	Pb	Sb	Si	V	Zn	Ash
Al	1																
Ca	0.28	1															
Co	0.18	0.79**	1														
Cr	0.29	0.58*	0.87**	1													
Cu	0.80**	0.27	0.05	-0.08	1												
Fe	0.53*	0.75**	0.90**	0.90**	0.24	1											
K	0.58*	0.31	-0.19	-0.32	0.69**	0.00	1										
Mg	0.56*	0.92**	0.80**	0.68**	0.49	0.86**	0.34	1									
Mn	-0.12	0.47	-0.01	-0.40	0.28	-0.13	0.63**	0.24	1								
Na	0.54**	0.73**	0.68**	0.51	0.67**	0.70**	0.29	0.85**	0.25	1							
Ni	-0.02	0.69**	0.86**	0.88**	-0.29	-0.17	-0.37	0.63*	-0.16	0.43	1						
Pb	0.06	-0.6*	-0.74**	-0.76**	0.29	-0.66**	0.50	-0.53*	0.20	-0.38	-0.83**	1					
Sb	0.37	0.56*	0.82**	0.98**	-0.05	0.89**	-0.29	0.69**	-0.45	0.47	.86**	-0.76**	1				
Si	0.30	0.59*	0.86**	0.99**	-0.08	0.89**	-0.32	0.68**	-0.40	0.51*	0.90**	-0.77**	0.98**	1			
V	-0.01	0.66**	0.90**	0.91**	-0.28	0.80**	-0.40	0.63*	-0.18	0.42	0.97**	-0.85**	0.87**	0.90**	1		
Zn	-0.06	0.85**	0.49	0.16	0.12	0.35	0.42	0.62*	0.83**	0.48	0.41	-0.29	0.10	0.16	0.38	1	
Ash	-0.26	-0.05	0.40	0.55*	-0.51	0.31	-0.63*	-0.04	-.53*	-0.11	0.58*	-0.37	0.52*	0.54*	0.58*	-0.22	1
$PM_{2.5}$	-0.63*	0.02	-0.05	-0.23	-0.42	-0.27	-0.25	-0.24	0.40	-0.10	-0.03	-0.24	-0.31	-0.22	-0.02	0.34	-0.19

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

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