

Supplementary File for:

Selection of Mineral Acids for Extraction of Rare Earth Elements and Critical Metals from Bauxite Ore Using Taguchi Method

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Table S1. Detection limits of ICP-MS and XRF

ICP-MS	Element	Ga	Rb	Cd	In	Cs	Y	La
	DL(ppb)	0.003896	0.006009	0.001257	0.004217	0.000481	0.000733	0.005357
	Element	Ce	Pr	Nd	Sm	Eu	Gd	Tb
	DL(ppb)	0.004332	0.004812	0.016522	0.000501	0.000301	0.003769	0.000073
	Element	Dy	Ho	Er	Tm	Yb	Lu	Th
	DL(ppb)	0.000842	0.00018	0.000289	0.000154	0.000234	0.000017	0.000153
XRF	Element	Ba	Nb	Sc	Sr	V	Zr	Major Ox.
	DL	5–4000 ppm	0.6–700 ppm	1.6–60 ppm	0.9–1650 ppm	1.4–340 ppm	4.9–550 ppm	0.01–99.9%

*DL is Detection Limit

Table S2. Experimental parameters and level for REEs and CRMs recovery from bauxite ore with different mineral acids

Mineral Acid	Leaching Parameters		Levels			
			1	2	3	4
H ₂ SO ₄	Concentration	(M)	1	2	3	4
	Temperature	(°C)	25	50	75	95
HCl	Time	(min)	60	120	240	480
HNO ₃	Solid/Liquid Ratio	(g/mL)	1/10	1/20	1/30	1/40

Table S3. Experimental Results of Leaching Efficiency for Sulfuric Acid

Exp. No	Conc. (M)	Time (min.)	Temp. (°C)	S/L Ratio	Al ₂ O ₃	SiO ₂	TiO ₂	Fe ₂ O ₃	Co	Ni	Zr	V	Sc	La	Y	Nd	Ce	Pr	Gd	Sm	Ga
BMS1	1	60	25	1/10	6.6	5.6	5.6	6.8	24.8	16.0	10.3	13.3	29.6	22.5	22.3	27.4	41.8	29.6	29.4	31.0	7.6
BMS2	1	120	50	1/20	6.1	9.6	8.2	14.6	30.3	21.6	12.6	18.5	44.8	82.5	47.7	84.8	85.4	84.9	77.7	83.9	15.0
BMS3	1	240	75	1/30	20.3	28.2	24.2	50.8	68.5	40.9	24.6	43.6	67.8	97.3	56.5	96.8	93.3	96.9	89.9	94.4	24.5
BMS4	1	480	95	1/40	25.3	30.3	25.8	87.5	83.3	58.6	26.2	66.6	72.4	98.4	59.6	98.4	94.7	98.3	92.2	96.7	31.8
BMS5	2	60	50	1/30	5.3	10.6	9.0	10.6	32.5	19.8	11.4	18.0	44.7	70.8	40.5	77.8	80.9	77.0	69.3	76.6	11.8
BMS6	2	120	25	1/40	15.0	19.7	17.1	19.8	35.5	27.6	22.0	24.1	43.2	49.2	38.6	62.0	72.6	60.9	56.7	61.6	20.8
BMS7	2	240	95	1/10	27.5	17.0	27.7	86.5	83.5	56.9	29.9	65.7	73.9	97.1	60.5	96.5	92.8	96.7	90.2	95.5	33.9
BMS8	2	480	75	1/20	28.8	31.8	25.8	49.8	78.3	49.4	21.4	62.2	72.4	97.8	57.8	97.8	94.0	97.7	91.4	95.9	22.4
BMS9	3	60	75	1/40	20.5	12.9	23.1	84.3	66.4	42.5	27.5	45.5	68.1	95.4	57.3	95.4	92.5	95.3	89.1	93.5	27.7
BMS10	3	120	95	1/30	23.6	22.6	24.7	77.4	78.1	48.8	22.3	59.0	72.1	97.2	57.1	97.2	93.5	96.9	91.0	95.0	26.1
BMS11	3	240	25	1/20	27.8	31.5	29.2	31.5	48.9	36.7	29.6	34.0	48.4	57.1	37.7	65.7	76.9	65.4	59.6	67.9	14.2
BMS12	3	480	50	1/10	11.1	9.4	10.6	38.2	59.9	31.6	14.0	33.6	61.9	95.7	47.8	95.4	91.2	95.2	87.1	93.1	6.6
BMS13	4	60	95	1/20	29.9	22.7	34.8	81.8	79.5	54.8	34.4	65.7	75.6	97.9	62.4	97.7	94.6	97.6	92.5	97.0	34.2
BMS14	4	120	75	1/10	27.5	23.0	30.8	63.0	72.7	48.8	33.8	51.9	69.1	96.3	56.3	95.9	92.8	95.9	89.9	94.8	23.6
BMS15	4	240	50	1/40	12.4	12.7	9.6	35.5	58.5	30.6	14.9	31.6	62.9	92.5	50.1	93.3	90.2	92.7	85.5	91.8	10.5
BMS16	4	480	25	1/30	13.6	16.2	13.9	21.0	41.6	27.1	17.7	25.1	45.5	69.6	36.2	76.9	82.3	75.6	68.8	76.5	0.2
BMS-OPT	4	480	95	1/30	39.2	29.8	37.2	95.1	90.4	73.5	26.5	72.0	82.0	97.6	54.1	97.8	95.2	97.7	91.8	95.5	40.0

Table S4. Experimental Results of Leaching Efficiency for Hydrochloric Acid

Exp. No	Conc. (M)	Time (min.)	Temp. (°C)	S/L Ratio	Al ₂ O ₃	SiO ₂	TiO ₂	Fe ₂ O ₃	Co	Ni	Zr	V	Sc	La	Y	Nd	Ce	Pr	Gd	Sm	Ga
BMH1	1	60	25	1/10	3.6	8.0	9.4	11.0	24.4	15.7	10.2	13.4	24.5	35.7	21.1	45.0	51.5	44.4	40.7	47.9	2.2
BMH2	1	120	50	1/20	6.4	2.8	0.8	4.1	34.1	17.0	7.7	15.4	39.8	92.7	39.4	90.4	87.3	90.5	82.5	89.2	0.9
BMH3	1	240	75	1/30	9.2	15.8	20.3	89.4	80.4	40.1	16.9	61.8	75.0	98.6	53.5	98.2	94.6	98.4	92.5	96.6	14.7
BMH4	1	480	95	1/40	13.6	21.3	16.8	91.0	84.3	53.0	15.8	64.2	75.5	98.4	48.8	98.2	93.9	98.4	91.4	96.7	8.6
BMH5	2	60	50	1/30	3.0	10.5	11.5	22.0	42.3	27.2	16.4	20.9	46.3	92.5	42.6	92.0	88.0	91.8	83.4	88.7	2.0
BMH6	2	120	25	1/40	6.4	8.2	8.3	10.6	29.3	16.6	9.7	15.1	36.0	77.9	38.9	81.4	81.5	80.9	74.5	78.7	4.6
BMH7	2	240	95	1/10	10.3	11.3	20.2	90.9	81.8	47.1	11.5	62.7	70.2	96.9	52.6	96.9	93.0	96.9	90.8	96.0	13.6
BMH8	2	480	75	1/20	6.9	12.4	19.2	81.0	76.5	41.5	14.5	56.8	67.3	98.4	48.4	98.2	93.7	98.3	90.1	95.8	8.8
BMH9	3	60	75	1/40	7.6	12.6	16.3	62.8	72.0	37.8	20.6	46.6	62.6	97.6	48.6	97.3	93.1	97.2	90.5	95.5	8.1
BMH10	3	120	95	1/30	9.2	12.0	17.4	92.4	83.5	46.2	14.5	64.1	73.2	98.3	52.3	98.3	94.3	98.3	91.7	96.5	12.3
BMH11	3	240	25	1/20	6.1	10.8	12.6	22.9	36.7	17.6	8.2	18.0	45.1	94.0	40.0	93.6	88.6	93.1	85.1	91.7	5.0
BMH12	3	480	50	1/10	4.5	3.1	7.0	43.2	60.9	28.4	9.2	33.1	57.4	97.5	42.1	96.7	92.1	96.8	89.2	94.9	6.9
BMH13	4	60	95	1/20	10.4	11.4	20.3	92.8	83.7	47.7	21.2	65.5	76.3	98.0	51.7	97.8	94.1	98.0	91.7	96.4	8.8
BMH14	4	120	75	1/10	6.1	6.2	18.1	82.9	77.5	38.1	14.7	56.8	68.4	97.3	47.4	96.8	92.5	97.1	90.3	95.2	1.9
BMH15	4	240	50	1/40	4.0	12.2	13.9	52.8	61.6	28.4	9.9	37.6	59.2	97.7	44.7	97.4	92.6	97.0	89.5	94.9	4.7
BMH16	4	480	25	1/30	4.9	11.4	9.3	31.4	48.4	24.0	12.5	20.1	51.9	93.6	35.0	94.6	90.5	94.4	87.3	92.9	0.6
BMH-OPT	4	480	95	1/30	14.8	19.7	22.2	94.3	87.5	65.7	13.3	64.2	76.2	98.1	46.0	98.2	95.1	98.3	91.0	96.6	15.5

Table S5. Experimental Results of Leaching Efficiency for Nitric Acid

Exp. No	Conc. (M)	Time (min.)	Temp. (°C)	S/L Ratio	Al ₂ O ₃	SiO ₂	TiO ₂	Fe ₂ O ₃	Co	Ni	Zr	V	Sc	La	Y	Nd	Ce	Pr	Gd	Sm	Ga
BMN1	1	60	25	1/10	2.9	1.7	0.9	1.4	18.7	9.8	7.2	6.6	21.5	26.0	17.4	35.0	39.4	33.5	33.0	38.7	1.8
BMN2	1	120	50	1/20	6.3	12.2	2.0	8.2	22.4	15.3	8.3	7.0	29.0	85.9	35.2	86.9	80.5	87.0	79.1	85.0	2.0
BMN3	1	240	75	1/30	3.3	10.8	6.5	18.3	40.9	22.1	7.5	6.5	49.0	97.0	44.2	94.5	90.5	94.5	87.3	92.5	1.5
BMN4	1	480	95	1/40	6.4	20.8	9.4	37.9	61.0	38.2	8.5	10.4	58.4	97.7	50.7	97.4	93.2	97.3	90.6	94.7	12.8
BMN5	2	60	50	1/30	0.7	7.1	6.3	9.4	30.7	16.5	9.9	9.5	30.2	86.6	41.3	88.6	82.7	87.5	81.9	86.5	10.9
BMN6	2	120	25	1/40	3.4	5.8	4.2	6.5	18.0	12.0	7.3	8.4	28.5	52.9	38.2	62.0	68.7	61.9	56.0	59.9	10.3
BMN7	2	240	95	1/10	5.9	7.6	6.2	34.6	61.7	30.9	3.6	8.5	58.3	97.5	56.2	97.0	92.5	96.8	88.9	94.6	21.7
BMN8	2	480	75	1/20	6.7	10.4	5.8	32.3	51.1	31.6	9.5	15.7	56.0	98.0	60.8	97.4	93.3	97.2	91.2	95.0	26.7
BMN9	3	60	75	1/40	3.2	10.7	9.5	18.6	35.7	23.3	11.1	14.0	42.5	97.1	55.7	96.3	90.7	96.4	86.9	93.6	15.5
BMN10	3	120	95	1/30	2.2	16.8	8.2	39.3	58.0	33.8	9.1	21.8	60.3	97.8	58.1	97.3	93.4	97.1	89.4	94.8	24.1
BMN11	3	240	25	1/20	1.6	5.4	7.2	9.2	23.2	14.1	8.4	8.1	30.4	67.4	42.6	74.8	77.1	75.3	65.9	73.4	7.8
BMN12	3	480	50	1/10	1.6	5.6	7.2	13.6	36.0	23.5	14.3	7.6	37.5	96.1	52.6	95.1	89.2	94.6	86.1	91.4	11.2
BMN13	4	60	95	1/20	6.8	2.4	1.0	30.5	64.7	27.4	9.4	16.8	55.6	97.3	50.1	96.7	92.0	96.7	88.6	93.4	9.6
BMN14	4	120	75	1/10	3.2	2.2	3.7	27.6	56.3	24.8	3.6	17.6	54.1	96.4	53.7	96.0	91.3	95.8	87.6	92.9	15.2
BMN15	4	240	50	1/40	2.8	6.5	6.9	12.2	22.8	17.5	7.6	11.2	37.5	96.4	48.9	95.2	88.9	95.1	85.6	92.3	5.5
BMN16	4	480	25	1/30	1.3	6.0	7.9	10.3	18.1	12.9	7.2	9.4	32.1	83.8	36.9	87.0	81.2	87.2	76.6	83.2	12.4
BMN-OPT	4	480	95	1/30	12.2	16.8	15.3	62.3	90.4	52.7	14.3	34.3	65.8	97.9	55.4	97.9	95.0	97.8	91.6	95.3	25.9

Table S6. ANOVA Analysis of Rare Earth Elements (REEs) from Bauxite Ore via Sulfuric Acid Leaching

Element	Source	DF	SS	MS	F Ratio	P Value	Cr (%)	Error (%)
Sc	Molarity	3	238.16	79.39	6.14	0.085	7.71	± 0.10
	Time	3	227.34	75.78	5.86	0.090	7.36	± 0.09
	Temperature	3	2582.35	860.78	66.55	0.003	83.63	± 1.04
	S/L Ratio	3	39.94	13.31	1.03	0.491	1.29	± 0.02
	Error	3	38.80	12.93				
	Total	15	3126.59					

Element	Source	DF	SS	MS	F Ratio	P Value	Cr (%)	Error (%)
Ce	Molarity	3	297.4	99.14	1.62	0.351	11.55	± 0.77
	Time	3	392.8	130.9	2.14	0.274	15.26	± 1.02
	Temperature	3	1696.0	565.34	9.23	0.050	65.86	± 4.38
	S/L Ratio	3	189.2	63.06	1.03	0.491	7.35	± 0.49
	Error	3	183.8	61.27				
	Total	15	2759.2					

Element	Source	DF	SS	MS	F Ratio	P Value	Cr (%)	Error (%)
La	Molarity	3	502.4	167.47	2.63	0.224	6.72	± 0.17
	Time	3	777.0	259.00	4.07	0.140	10.39	± 0.26
	Temperature	3	6090.8	2030.26	31.88	0.009	81.48	± 2.03
	S/L Ratio	3	106.4	35.46	0.56	0.679	1.42	± 0.04
	Error	3	191.0	63.68				
	Total	15	7667.6					

Element	Source	DF	SS	MS	F Ratio	P Value	Cr (%)	Error (%)
Gd	Molarity	3	329.9	109.95	2.30	0.255	7.15	± 0.22
	Time	3	476.6	158.88	3.33	0.175	10.32	± 0.31
	Temperature	3	3694.1	1231.35	25.81	0.012	80.00	± 2.41
	S/L Ratio	3	116.5	38.85	0.81	0.565	2.52	± 0.08
	Error	3	143.1	47.70				
	Total	15	4760.2					

Element	Source	DF	SS	MS	F Ratio	P Value	Cr (%)	Error (%)
Pr	Molarity	3	402.9	134.31	1.99	0.293	7.62	± 0.28
	Time	3	624.2	208.08	3.09	0.190	11.80	± 0.43
	Temperature	3	4105.8	1368.61	20.32	0.017	77.60	± 2.86
	S/L Ratio	3	157.5	52.51	0.78	0.579	2.98	± 0.11
	Error	3	202.1	67.35				
	Total	15	5492.6					

Element	Source	DF	SS	MS	F Ratio	P Value	Cr (%)	Error (%)
Sm	Molarity	3	425.2	141.73	2.19	0.268	9.09	± 0.36
	Time	3	579.7	193.25	2.99	0.196	12.40	± 0.50
	Temperature	3	3510.1	1170.04	18.10	0.020	75.08	± 3.00
	S/L Ratio	3	160.4	53.46	0.83	0.560	3.43	± 0.14
	Error	3	194.0	64.66				
	Total	15	4869.4					

Element	Source	DF	SS	MS	F Ratio	P Value	Cr (%)	Error (%)
Y	Molarity	3	47.62	15.87	0.99	0.503	2.53	± 0.06
	Time	3	74.08	24.69	1.54	0.366	3.93	± 0.10
	Temperature	3	1688.22	562.74	35.09	0.008	89.59	± 2.23
	S/L Ratio	3	74.10	24.70	1.54	0.366	3.93	± 0.10
	Error	3	48.12	16.04				
	Total	15	1932.13					

Element	Source	DF	SS	MS	F Ratio	P Value	Cr (%)	Error (%)
Nd	Molarity	3	463.6	154.53	2.00	0.292	8.53	± 0.35
	Time	3	678.3	226.09	2.93	0.200	12.48	± 0.51
	Temperature	3	4092.1	1364.03	17.67	0.021	75.28	± 3.08
	S/L Ratio	3	202.5	67.51	0.87	0.543	3.72	± 0.15
	Error	3	231.5	77.18				
	Total	15	5668.0					

Table S7. ANOVA Analysis of Rare Earth Elements (REEs) from Bauxite Ore via Hydrochloric Acid Leaching

Element	Source	DF	SS	MS	F Ratio	P Value	Cr (%)	Error (%)
Sc	Molarity	3	1265.7	421.9	3.94	0.145	24.99	± 1.49
	Time	3	1270.6	423.5	3.96	0.144	25.08	± 1.49
	Temperature	3	1665.9	555.3	5.19	0.105	32.88	± 1.96
	S/L Ratio	3	864.2	288.1	2.69	0.219	17.05	± 1.02
	Error	3	321.0	107.0				
	Total	15	5387.5					

Element	Source	DF	SS	MS	F Ratio	P Value	Cr (%)	Error (%)
Ce	Molarity	3	288.9	96.30	1.60	0.354	19.42	± 2.10
	Time	3	307.1	102.36	1.70	0.336	20.64	± 2.23
	Temperature	3	658.7	219.58	3.66	0.158	44.28	± 4.78
	S/L Ratio	3	232.8	77.60	1.29	0.419	15.66	± 1.69
	Error	3	180.2	60.07				
	Total	15	1667.7					

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Element	Source	DF	SS	MS	F Ratio	P Value	Cr (%)	Error (%)
La	Molarity	3	633.4	211.1	1.41	0.392	19.38	± 2.34
	Time	3	674.3	224.8	1.50	0.373	20.64	± 2.49
	Temperature	3	1436.4	478.8	3.20	0.182	43.94	± 5.30
	S/L Ratio	3	524.9	175.0	1.17	0.450	16.04	± 1.93
	Error	3	448.2	149.4				
	Total	15	3717.3					

Element	Source	DF	SS	MS	F Ratio	P Value	Cr (%)	Error (%)
Gd	Molarity	3	426.4	142.12	1.60	0.355	19.76	± 2.17
	Time	3	446.4	148.78	1.67	0.342	20.68	± 2.28
	Temperature	3	988.6	329.53	3.70	0.156	45.79	± 5.04
	S/L Ratio	3	296.2	98.75	1.11	0.467	13.72	± 1.51
	Error	3	267.2	89.06				
	Total	15	2424.7					

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Element	Source	DF	SS	MS	F Ratio	P Value	Cr (%)	Error (%)
Pr	Molarity	3	490.8	163.6	1.62	0.351	20.34	± 2.27
	Time	3	509.4	169.8	1.68	0.340	21.11	± 2.36
	Temperature	3	1043.9	348.0	3.45	0.168	43.26	± 4.83
	S/L Ratio	3	366.7	122.2	1.21	0.439	15.29	± 1.71
	Error	3	302.9	101.0				
	Total	15	2713.8					

Element	Source	DF	SS	MS	F Ratio	P Value	Cr (%)	Error (%)
Sm	Molarity	3	395.2	131.73	1.60	0.354	19.68	± 2.15
	Time	3	438.8	146.27	1.78	0.324	21.86	± 2.39
	Temperature	3	902.9	300.98	3.66	0.157	44.98	± 4.93
	S/L Ratio	3	270.9	90.29	1.10	0.470	13.49	± 1.48
	Error	3	246.8	82.25				
	Total	15	2254.6					

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Element	Source	DF	SS	MS	F Ratio	P Value	Cr (%)	Error (%)
Y	Molarity	3	67.54	22.51	1.35	0.407	6.81	± 0.33
	Time	3	91.41	30.47	1.82	0.317	9.21	± 0.44
	Temperature	3	768.87	256.29	15.31	0.025	77.47	± 3.73
	S/L Ratio	3	64.56	21.52	1.29	0.421	6.51	± 0.31
	Error	3	50.21	16.74				
	Total	15	1042.58					

Element	Source	DF	SS	MS	F Ratio	P Value	Cr (%)	Error (%)
Nd	Molarity	3	494.0	164.67	1.70	0.338	20.99	± 2.31
	Time	3	502.6	167.54	1.73	0.333	21.36	± 2.35
	Temperature	3	990.7	330.24	3.40	0.171	42.10	± 4.64
	S/L Ratio	3	366.8	122.27	1.26	0.427	15.58	± 1.71
	Error	3	291.3	97.10				
	Total	15	2645.4					

Table S8. ANOVA Analysis of Rare Earth Elements (REEs) from Bauxite Ore via Nitric Acid Leaching

Element	Source	DF	SS	MS	F Ratio	P Value	Cr (%)	Error (%)
Sc	Molarity	3	61.45	20.49	2.36	0.249	2.37	± 0.02
	Time	3	158.95	52.98	6.11	0.086	6.13	± 0.06
	Temperature	3	2367.56	789.19	91.02	0.002	91.38	± 0.90
	S/L Ratio	3	3.72	1.24	0.14	0.928	0.14	± 0.00
	Error	3	26.01	8.67				
	Total	15	2617.69					

Element	Source	DF	SS	MS	F Ratio	P Value	Cr (%)	Error (%)
Ce	Molarity	3	389.9	129.98	2.58	0.228	14.29	± 0.75
	Time	3	395.5	131.83	2.62	0.225	14.50	± 0.76
	Temperature	3	1749.1	583.02	11.58	0.037	64.09	± 3.36
	S/L Ratio	3	194.3	64.77	1.29	0.420	7.12	± 0.37
	Error	3	151.0	50.34				
	Total	15	2879.8					

Element	Source	DF	SS	MS	F Ratio	P Value	Cr (%)	Error (%)
La	Molarity	3	644.8	214.93	2.34	0.252	10.72	± 0.47
	Time	3	676.0	225.33	2.45	0.240	11.24	± 0.49
	Temperature	3	4379.9	1459.97	15.89	0.024	72.83	± 3.19
	S/L Ratio	3	312.8	104.28	1.14	0.460	5.20	± 0.23
	Error	3	275.6	91.87				
	Total	15	6289.1					

Element	Source	DF	SS	MS	F Ratio	P Value	Cr (%)	Error (%)
Gd	Molarity	3	325.3	108.45	2.18	0.269	9.16	± 0.37
	Time	3	395.5	131.84	2.65	0.222	11.14	± 0.45
	Temperature	3	2621.9	873.95	17.57	0.021	73.94	± 2.98
	S/L Ratio	3	210.3	70.10	1.41	0.392	5.76	± 0.23
	Error	3	149.2	49.74				
	Total	15	3702.2					

Element	Source	DF	SS	MS	F Ratio	P Value	Cr (%)	Error (%)
Pr	Molarity	3	564.2	188.05	2.12	0.277	13.39	± 0.80
	Time	3	544.1	181.35	2.04	0.286	12.92	± 0.77
	Temperature	3	2818.3	939.42	10.57	0.042	66.90	± 3.98
	S/L Ratio	3	287.0	95.66	1.08	0.476	6.81	± 0.41
	Error	3	266.5	88.84				
	Total	15	4480.0					

Element	Source	DF	SS	MS	F Ratio	P Value	Cr (%)	Error (%)
Sm	Molarity	3	378.9	126.31	2.16	0.271	10.89	± 0.52
	Time	3	396.3	132.10	2.26	0.260	11.38	± 0.55
	Temperature	3	2497.6	832.54	14.27	0.028	71.73	± 3.44
	S/L Ratio	3	208.8	69.62	1.19	0.444	5.99	± 0.29
	Error	3	175.1	58.36				
	Total	15	3656.8					

Element	Source	DF	SS	MS	F Ratio	P Value	Cr (%)	Error (%)
Y	Molarity	3	531.87	177.29	202.04	0.001	29.21	± 0.04
	Time	3	181.09	60.36	68.79	0.003	9.94	± 0.01
	Temperature	3	1075.99	358.66	408.72	0.000	59.08	± 0.08
	S/L Ratio	3	32.41	10.80	12.31	0.034	1.78	± 0.00
	Error	3	2.63	0.88				
	Total	15	1823.99					

Element	Source	DF	SS	MS	F Ratio	P Value	Cr (%)	Error (%)
Nd	Molarity	3	533.2	177.73	2.19	0.268	12.98	± 0.73
	Time	3	507.1	169.02	2.08	0.281	12.34	± 0.69
	Temperature	3	2805.5	935.15	11.54	0.037	68.33	± 3.82
	S/L Ratio	3	262.0	87.32	1.08	0.476	6.38	± 0.36
	Error	3	243.2	81.07				
	Total	15	4350.9					