NATIONAL ENERGY AUTHORITY
Department of Economic Geology

NINE ANALYSIS OF ICELANDIC BASALTS FOR BASALT CASTING STUDIES.

By
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Localities of samples.

Attached are nine petrochemical analysis of basalts carried out at the request of Svavar Jónatansson for exploration of raw material for basalt casting. The samples are from the following localities. Exact sample point are not known but can be obtained from Dr. L. Koeský.

Basalt 20	Laugarás, Biskupstungur
Basalt 21	Skarðsfjall, Rangárvallasýsla
Basalt 22	Ás, Holt, Rangárvallasýsla
Basalt 23	Laugaland Rangárvallasýsla
Basalt 24	Landssveit
Basalt 25	Akbrautarholt, Landssveit
Basalt 26	Snæfellsnes
Basalt 27	Kerlingarskarð Snæfellsnes
Basalt 28	Snæfellsnes

Analytical Methods

SiO_2, Al_2O_3, TiO_2, CaO, K_2O and total Fe as Fe_2O_3 were determined by x-ray fluorescence.
FeO was determined by titration with $KMnO_4$
MgO was determined by atomic adsorption from B-solution
Na_2O was determined by flame photometer from B-solution
MnO was determined as permanganate spectrophotometrically
P_2O_5 was determined spectrophotometrically using molybden-vanadat complex at 420 µm
H_2O^+ was determined gravimetrically after ignation
H_2O^+ was determined gravimetrically by heating for six hours at 105°C

Chemical analysis were carried out in the laboratory of National Energy Authority. X-ray fluorescene instrument of the Science Institute of the University was used and

atomic adsorption instrument of the Acricultural Research Institute.

The analysis no 26 should perhaps be taken with caution. X-ray fluorescence analysis was made in duplicate and the total were 96.21 and 104.34 but the average is near 100%.

Table 1

	Basalt 20	Basalt 21	Basalt 22	Basalt 23	Basalt 24	Basalt 25	Basalt 26	Basalt 27	Basalt 28
SiO_2	48.47	50.00	46.79	46.68	47.13	47.15	47.73	50.52	51.40
Al_2O_3	12.48	12.83	13.35	13.44	13.32	13.19	13.93	12.83	13.10
TiO_2	3.24	3.24	3.53	3.42	3.57	3.66	1.65	2.18	2.15
Fe_2O_3	3.10	1.78	2.70	1.97	2.34	2.17	3.04	4.74	3.79
FeO	12.42	12.59	11.40	11.76	11.73	12.25	9.78	8.97	8.96
MnO	0.26	0.27	0.26	0.21	0.26	0.27	0.20	0.24	0.26
MgO	5.19	4.80	5.32	5.71	5.58	5.19	6.88	3.89	4.80
CaO	10.23	9.78	11.57	11.23	11.05	11.03	11.53	8.27	9.19
Na_2O	2.71	2.68	2.68	3.15	2.80	2.73	2.26	2.93	2.80
K_2O	0.43	0.67	0.48	0.56	0.58	0.58	0.30	0.53	0.83
P_2O_5	0.40	0.40	0.38	0.38	0.36	0.40	0.18	0.20	0.25
H_2O^+	1.38	1.20	0.49	0.64	0.48	0.44	2.55	4.74	1.75
H_2O^-	0.30	0.01	0.01	0.05	0.00	0.00	0.24	0.08	0.15
Total	100.61	100.25	98.96	99.20	99.20	99.06	100.27	100.12	99.43
Fe_2O_3 total	16.90	15.77	15.37	15.04	15.37	15.78	13.91	14.71	13.74

BASALT 20

SIO2	48.47	49.75
AL2O	12.48	7.55
TIO2	3.24	2.50
FE2O	3.10	1.19
FEO	12.42	10.66
MNO	.26	.22
MGO	5.19	7.94
CAO	10.23	11.25
NA2O	2.71	2.69
K2O	.43	.28
P2O5	.40	.17
H2O	1.68	5.75
	100.61	100.00

QZ	1.41
OR	2.54
AB	22.93
AN	20.61
LC	0.00
NE	0.00
CO	0.00
WO	11.59
EN	5.26
FS	6.25
EN	7.66
FS	9.12
FO	0.00
FA	0.00
MT	4.49
IM	6.15
HM	0.00
AP	.87
RT	0.00
VN	1.67
	100.61

BARTHS VALUE = 129.14

BASALT 21

SIO2	50.00	51.92
AL2O	12.83	7.85
TIO2	3.24	2.53
FE2O	1.78	.69
FEO	12.59	10.93
MNO	.27	.23
MGO	4.80	7.42
CAO	9.78	10.88
NA2O	2.68	2.69
K2O	.67	.44
P2O5	.40	.17
H2O	1.21	4.19
	100.25	100.00

QZ	2.53
OR	3.95
AB	22.67
AN	20.99
LC	0.00
NE	0.00
CO	0.00
WO	10.50
EN	4.38
FS	6.16
EN	7.56
FS	10.63
FO	0.00
FA	0.00
MT	2.58
IM	6.15
HM	0.00
AP	.87
RT	0.00
VN	1.20
	100.24

BARTHS VALUE = 128.60

BASALT 22

SIO2	46.79	50.23
AL2O	13.35	8.44
TIO2	3.53	2.85
FE2O	2.70	1.09
FEO	11.40	10.23
MNO	.26	.23
MGO	5.32	8.51
CAO	11.57	13.30
NA2O	2.68	2.78
K2O	.48	.32
P2O5	.38	.17
H2O	.50	1.79
	98.96	100.00

QZ	0.00
OR	2.83
AB	22.67
AN	22.97
LC	0.00
NE	0.00
CO	0.00
WO	13.43
EN	6.57
FS	6.62
EN	3.79
FS	3.82
FO	2.01
FA	2.24
MT	3.91
IM	6.70
HM	0.00
AP	.83
RT	0.00
VN	.49
	98.95

BARTHS VALUE = 116.95

BASALT 23

SIO2	46.68	49.47
AL2O	13.44	8.39
TIO2	3.42	2.72
FE2O	1.97	.78
FEO	11.76	10.42
MNO	.21	.18
MGO	5.71	9.01
CAO	11.23	12.75
NA2O	3.15	3.23
K2O	.56	.37
P2O5	.38	.17
H2O	.69	2.44
	99.20	100.00

QZ	0.00
OR	3.30
AB	24.53
AN	20.87
LC	0.00
NE	1.14
CO	0.00
WO	13.60
EN	6.58
FS	6.80
EN	0.00
FS	0.00
FO	5.32
FA	6.10
MT	2.85
IM	6.49
HM	0.00
AP	.83
RT	0.00
VN	.68
	99.17

BARTHS VALUE = 108.45

BASALT 24

SIO2	47.13	50.36
AL2O	13.32	8.38
TIO2	3.57	2.86
FE2O	2.34	.94
FEO	11.73	10.48
MNO	.26	.23
MGO	5.58	8.88
CAO	11.05	12.65
NA2O	2.80	2.90
K2O	.58	.39
P2O5	.36	.16
H2O	.48	1.71
	99.20	100.00

QZ	0.00
OR	3.42
AB	23.69
AN	22.06
LC	0.00
NE	0.00
CO	0.00
WO	12.79
EN	6.21
FS	6.35
EN	3.34
FS	3.41
FO	3.02
FA	3.42
MT	3.39
IM	6.78
HM	0.00
AP	.78
RT	0.00
VN	.47
	99.18

BARTHS VALUE = 115.51

BASALT 25

SIO2	47.15	50.60
AL2O	13.19	8.34
TIO2	3.66	2.95
FE2O	2.17	.87
FEO	12.25	10.99
MNO	.27	.24
MGO	5.19	8.30
CAO	11.03	12.68
NA2O	2.73	2.84
K2O	.58	.39
P2O5	.40	.18
H2O	.44	1.57
	99.06	100.00

QZ	0.00
OR	3.42
AB	23.10
AN	22.02
LC	0.00
NE	0.00
CO	0.00
WO	12.66
EN	5.78
FS	6.78
EN	4.21
FS	4.94
FO	2.03
FA	2.65
MT	3.14
IM	6.95
HM	0.00
AP	.87
RT	0.00
VN	.43
	99.05

BARTHS VALUE = 119.02

BASALT 26

SIO2	47.73	47.23
AL2O	13.93	8.12
TIO2	1.65	1.22
FE2O	3.04	1.13
FEO	9.78	8.09
MNO	.20	.16
MGO	6.88	10.14
CAO	11.53	12.22
NA2O	2.26	2.16
K2O	.30	.18
P2O5	.18	.07
H2O	2.79	9.21
	100.27	100.00

QZ	0.00
OR	1.77
AB	19.12
AN	26.97
LC	0.00
NE	0.00
CO	0.00
WO	12.17
EN	6.65
FS	5.08
EN	8.92
FS	6.82
FO	1.08
FA	.91
MT	4.40
IM	3.13
HM	0.00
AP	.39
RT	0.00
VN	2.79
	100.26

BARTHS VALUE = 120.30

BASALT 27

SIO2	50.52	48.94
AL2O	12.83	7.32
TIO2	2.18	1.58
FE2O	4.74	1.72
FEO	8.97	7.26
MNO	.24	.19
MGO	3.89	5.61
CAO	8.27	8.58
NA2O	2.93	2.75
K2O	.53	.32
P2O5	.20	.08
H2O	4.82	15.58
	100.12	100.00

QZ	8.36
OR	3.13
AB	24.79
AN	20.29
LC	0.00
NE	0.00
CO	0.00
WO	8.16
EN	4.05
FS	3.94
EN	5.62
FS	5.46
FO	0.00
FA	0.00
MT	6.87
IM	4.14
HM	0.00
AP	.43
RT	0.00
VN	4.81
	100.10

BARTHS VALUE = 114.22

BASALT 28

SIO2	51.40	53.22
AL2O	13.10	7.99
TIO2	2.15	1.67
FE2O	3.79	1.47
FEO	8.96	7.75
MNO	.26	.22
MGO	4.80	7.40
CAO	9.19	10.19
NA2O	2.80	2.81
K2O	.83	.54
P2O5	.25	.10
H2O	1.90	6.56
	99.43	100.00

QZ	6.09
OR	4.90
AB	23.69
AN	20.72
LC	0.00
NE	0.00
CO	0.00
WO	9.76
EN	5.10
FS	4.38
EN	6.84
FS	5.87
FO	0.00
FA	0.00
MT	5.49
IM	4.08
HM	0.00
AP	.54
RT	0.00
VN	1.89
	99.42

BARTHS VALUE = 119.72