PETROCHEMICAL CHARACTERISTICS AND GEOCHRONOLOGY OF THE IGNEOUS ROCKS IN BILIN AND ITS ENVIRONS, BILIN TOWNSHIP, MON STATE

Mya Moe Khaing¹, Hla Kyi², Thein Win³

Abstract

The research area is located in Bilin Township and its vicinity, Mon State. It lies between Lattitude 17°12'45"N to 17°21'45"N and Longitude 97°09'00"E to 97°14'45"E. The total area coverage is about 116.5 km². Four samples were sent to ALS laboratory of Geological Survey of Japan and analysed by XRF and LA-ICPMS. Eight samples were analyzed at DSSTRC (Defence Service Science and Technology Research Centre) in Pyin-Oo-Lwin Township and seven samples were sent to Geology Department, Mandalay University for XRF analysis. Geochemically, biotite granite, biotite-muscovite granite and biotite microgranite show chemical composition (weight percent) of SiO₂ (69.4 - 75.96), Al₂O₃ (13.34-16.8), TiO₂ (0.154-0.284), Na₂O+K₂O (7.765-10.31), Fe₂O₃+MgO (1.149-2.64), MnO (0.039-0.151), CaO (0.897-3.14) and P₂O₅ (0.027-0.159), suggesting calc-alkaline series and are predominantly peraluminous. Diorites and microdiorite exhibit SiO₂ (52.3-55.95), Al₂O₃ (17.69-22.3), TiO₂ (0.738-0.973), Na₂O+K₂O (4.95-6.364), Fe₂O₃+MgO (9.211-13.35), MnO (0.121-0.359), CaO (5.435-7.51) and P₂O₅ (0.285-0.602); proposing calc- alkaline series and are metaluminous. According to Harker's variation diagrams, TiO₂ Al₂O₃, Fe₂O₃, MnO, CaO, MgO and P₂O₅ are negatively correlated with SiO₂ and then Na₂O, K₂O are positively correlated with SiO₂. Result from geochemical analysis, biotitemuscovite granite and some biotite granites have high sodium content, normatic corundum ranges from 0.831 to 0.974 and biotite microgranite is low in sodium content, NaO₂ Vs K₂O diagram shows that the granitic rocks involve both I and S-types, Chappell and White (1994). Based on the tectonic discrimination diagram of Maniar and Piccoli (1989), the granitic rocks fall within the IAG+CAG+CCG field. In Y Vs Nb diagram; all the granitic rocks fall in the field of Syn-COLG and VAG. Y+Nb Vs Rb diagram indicates that all granites fall in the VAG field. U-Pb zircon dating of the biotite granite from the northern part of Lakhin pogoda gives the age of 51.9 ± 0.7 Ma and suggests that the biotite granite was emplaced in Eocene.

Keywords; calc-alkaline, peraluminous, I-type, S-type, COLG, VAG, fractional crystallization

Introduction

The study area is chiefly covered by igneous and metasedimentary rocks, Fig (1). Igneous rocks are well exposed in the northern, north-western and south-eastern parts and metasedimentary rocks are cropped out in the central and western parts of the study area. Best exposure is observed along the stream sections and along the crest of the ridges.

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Figure 1 Geological Map of Bilin and its environment, Bilin Township, Mon State

Materials and Methods

The representative igneous rock samples including 6 biotite granites (sample no. KK-11, NG-23, mmk-1, mmk-5, mmk-11, mmk-13), 1 biotite-muscovite granite, (sample no. KK-04), 1 biotite microgranite, (sample no.15-26), 2 diorites, (sample no. R-01, KS-13), 1 microdiorite, (sample no. KS-04), 5 pyroxenites, (sample no. R-02, R-03, R-04, R-05, R-06), 1 hornblendite, (sample no. R-07), 2 lamprophyres (spessartite), (sample no.B-04, R-08) from the study area were selected for analysis. Four samples were sent to ALS laboratory of Geological Survey of Japan and analysed by XRF and LA-ICPMS. Eight igneous rock samples from the study area were analysed at DSSTRC (Defence Service Science and Technology Research Centre) in Pyin-Oo-Lwin Township and seven igneous rock samples were analysed at the Department of Geology, Mandalay University. The major oxide and trace elements abundance were determined by X-ray fluorescence spectrometry.

Results and Findings

The igneous rocks of the study area are biotite granites, biotite-muscovite granite, biotite microgranite, diorites, microdiorite, pyroxenites and hornblendite. The biotite granites, biotite-muscovite granite and biotite microgranite show chemical composition (weight percent) of SiO₂ (69.4 - 75.96), Al₂O₃ (13.34-16.8), TiO₂ (0.154-0.284), Na₂O+K₂O (7.765- 10.31), Fe₂O₃+MgO (1.149-2.64), MnO (0.039-0.151), CaO (0.897-3.14) and P₂O₅ (0.027-0.159) The chemical composition (weight percent) of diorites and microdiorite exhibit SiO₂ (52.3-55.95), Al₂O₃ (17.69-22.3), TiO₂ (0.738-0.973), Na₂O+K₂O (4.95-6.364), Fe₂O₃+MgO (9.211-13.35), MnO

(0.121-0.359), CaO (5.435-7.51) and P₂O₅ (0.285-0.602). Pyroxenites indicate SiO₂ (43.38-47.91), Al₂O₃ (13.10-25.56), TiO₂ (0.443-1.11), Na₂O+K₂O (2.005-4.74), Fe₂O₃+MgO (10.98-21.86), MnO (0.074-0.251), CaO (8.696-13.27) and P₂O₅ (0.060-0.421). Hornblendite illustrates the chemical composition (weight percent) of SiO₂ (43.81), Al₂O₃ (20.57), TiO₂ (1.07), Na₂O+K₂O (3.246), Fe₂O₃+MgO (16.96), MnO (0.127), CaO (11.89) and P₂O₅ (0.11). SiO₂ -Na₂O+K₂O - FeO_t+MgO diagram, (Fig. 2) shows the rise of SiO₂ and depletion of FeO_t + MgO during the entire process of magmatic differentiation. In Harker's variation diagram, Al₂O₃, TiO₂, Fe₂O₃, CaO, MgO, MnO and P₂O₅ are negatively correlated with SiO₂. Na₂O and K₂O are positively correlated with SiO₂. Plots of Harker's variation diagrams, selected trace elements of Ba, Sn, Nb, Zn, Rb, Zr, Y and Mo are positively correlated with SiO₂. Plots of trace elements Sr, Ni, Ce versus SiO_2 show decreasing of those elements with increasing of SiO_2 contents, Fig (3). The normative anorthite content against the Thornton and Tuttle Differentiation Index (TTDI) diagram show the degree of differentiation, the hornblendite and diorite contain proportionately more normative anorthite in plagioclase than the biotite granite, shown in Fig (4). Na₂O+K₂O/Al₂O₃ Vs SiO₂ variation diagram, Fig (5) and K₂O Vs SiO₂, Fig (6) show the trend of magmatic differentiation. Plot of alkali $(Na_2O + K_2O)$ versus silica (SiO_2) diagram, Fig (7) exhibits the granitic rocks in the study area fall in the subalkaline series. K₂O Vs Na₂O diagram, Fig (8) shows that the granitic rocks of the study area involve both I-type and S-type. TAS diagram after Cox et. al. (1979), Fig (9) indicates four groups of igneous and the dividing line between alkaline and subalkaline magma series. The igneous rocks from the study area generally range from acid to ultrabasic group and belong to the subalkaline affinity. The granites are predominantly peraluminous with high Aluminum Saturation Indexes (ASI) of A/NK (Molecular Al₂O₃/Na₂O+K₂O) and A/CNK (Molecular Al₂O₃/ CaO +Na₂O+K₂O) ranging from 1.384 to 1.879 and from 1.054 to 1.524, respectively. In the Na₂O - Al₂O₃ - K₂O diagram, the granitic rocks in the study area fall in the peraluminous field. Diorite and microdiorite fall in the metaluminous field.

Genetic Type of Granitoid Rocks

Geochemical analysis data, Table (1) have been plotted on a various diagram to distinguish I and S type granitic rocks. K_2O Vs Na₂O diagram show that the granitic rocks of the study area involve both I-type and S-type. Some biotite granites are relatively high in sodium, Na₂O normally > 3.2% in the range of (3.57%-3.93%) with approximately 5% K₂O and one biotite granite and one biotite-muscovite granite from Koktheinnayon pagoda are low in sodium, Na₂O normally < 3.2%, their content are 2.72% and 3.072%. The normative corundum ranges from 0.757 - 0.974. Only biotite microgranite is sodium low, Na₂O (2.86%), it is generally < 3.2%. Lack of normative magnetite is characteristic of S-type. Above these facts, the granitic rocks in the study area are I and S-types granite according to Chappell and White (1974). The relatively high quartz content, up to 35.24 wt% of this S type granite can be considered that this granite was derived from the quartz rich sedimentary rocks. It may be formed from the supracrustal origin (Chappell and White, 2001).

Table 1	Major oxi	de and	trace	elements	abundances	of th	e igneous	rocks	from	the	study
	area										

Sample No	KK-11	15-16	295-23	KK-04	mmk-1	mmk-5	mmk-l	1 mmk	-13	2-04	R-05
200	71.0	40.7	40.4	70.4	74.04					48.8	41.01
									- +		21.72
TIO;	0.159	0.256	0.212	0.202	0.156	0.266	0.161	0.2		0.67	0.637
AL_O_	15.2	13.9	16.5	16	13.65	14.59	13.34	14.4	1	19.4	14.5
Fe-O.	1.13	2.39	0.855	1.19	0.973	2.076	1.057	1.5	8	10.5	9.694
MaO	0.059	0.075	0.055	0.151	0.039	0.065	0.05	0.0		0.227	0.155
MeO	0.324	0.244	0.004	0.101	0.222	0.46	0.200	0.4		4 30	2.049
1020									-		
<u> </u>	1.54	2.14	1.39	1.29	1.01	1.109	0.897	1.6		7.69	7.545
Na ₂ O	2.72	2.56	3.75	3.072	3.577	3.933	3.695	2.7		4.29	3.05
K-0	6.79	7.15	6.53	6.37	4.55	3,532	4.55	4.22	15	3.56	2.91
									-		
P:01	0.105	0.129	0.161	0.129	0.027	0.056	0.031	0.0		0.200	0.522
Total	99.93	99.94	99.67	99.55	100	99.7	99.57	100	.5	99.7	97.95
A/CNK	1.375	1.054	1.411	1.605	1.472	1.524	1.455	1.53	X	1.264	1.075
4.000	1.400	1 1 1 1	1.000	1 424	1.000	1.000	1 411				
2000	1.299	1.495	1.049	1.282	1,822	1.8.0	1.814	1.85	~	2.671	2.551
Sn	15.51	5.554	15.97	-	6.969	15.45		11.3	8	-	
Cd	45.59	29,22	50.24	23.15	20.05	20.27	5.344	25.1	7	2,514	1.556
40	22.3	11.63	24.55	12.4	-	23.65	-	15.2	14	3.571	2,294
	44.80	28 21	40.15	20.52	20.54	24.0	14.24			1 504	2 482
							10.00				
Rh.	40.64	20	26.66	27.66	13.15	28.55	5,199	22	7	1.267	
Ru	6.666	4.36	6.907	4.166	2,351	5.912	-	4.3	9 L	-	-
Mo	6.025	4,79	5.554	2,745	5,156	5.006	2,767	4.53	N .	0.062	0.067
335	8.476	5.055	12.21	5.24	4.00	4.762	2,691	4.3	7	0.051	0.049
	10.10	10.01	10.11		44.74						
7 0	19,19	10.71	20.11	20.07	96.15	8.918	8.716	3.2	-	0.040	2.302
Ga	5.512	5.555	7.564	6.026	-	4.621	2.46	2.03	7	-	0.01
Zn	6.667	6.103	6.396	10.1	17.45	9,104	15.94	6.5	55	6.275	11.05
0		-	6.051	3,929	6,226	4,052	5,050	1.10	15	5,743	2,992
0		4.70		11.45	5.6.4	0	7.047			10.20	0.497
			110.0	24.1.4		-	1.001		-	010	
54	714.4	189.9	830.9	766.5	776.5	771.4	365	797		915	897
Ma	26.41	20.52	61.5	55,67	24.67	20.91	22.1	25.0	84	17.55	21.7
T		-	-		-	-	-	-		14.14	19.52
344	0.234	0.492	0.214	0.214	0.355	0.745	0.655	0.74	25	0.714	0.14
	0.000	0.240	0.014			0.104	0.000		-	0.00	0.00
	0.220	0.369	0.236	0.2		0.185	0.259	0.13		0.51	0.546
<u> </u>	16.65	26.42	17.1	14.35	16.55	12.65	24.19	17.	1	29.5	37.3
La	0.174	0.247	0.135	0.106	-	0.152	0.206	0.2	7	0.295	0.311
1	214.5	225.2	175.2	149.9	543.6	747.4	611 -	4.14		0.205	0 311
		0.000	0.000	0.000	2.012	0.144	0.40	0.00		0.004	0.010
		0.044	0.048	0.044	2012	0.100	0.594	0.43	-		Stata .
27	66.22	36.26	23.57	69.11	59.92	\$9.15	105.2	105.	21	36.96	65.69
Y	1.54	-	2.05	5.57	2.06	2.66	1.56	-		1.72	2.15
5	62.25	72.05	26.21	69.23	21.11	176.9	163.7	177	1	206.7	675.4
	84.18	00.21	125.0	00.57	17.4	45.05	48.37	10.1	12	28.18	27.22
	4 4 4 4	4 4 4 4			12.00	0.000	10.00				100.00
<u> </u>	0.000	6.625	2,801	7.120	12.95	9.559	10.56	8.7	8	36,12	38.51
ĸ	20.45	22.15	21.64	20.27	23.25	20.46	20.33	17.3	2	11.46	11.47
1	1.3	1.539	1.501	1.335	2.022	1.856	1.927	1.5	5	19.22	23.14
	24.05	25.21	21.26	22.7	24.26	26.15	20.72	25.4		10.01	19.11
	1.02	1.47.4	1 404			1 1 1 1		-			100.00
	4.87	1.545	1.000	1.555		1.153	1.141	0.8	2/	20,15	20.22
									_		
	0.715	0.596	0.713	0.609	13.85	2,959	7,203	7.2	2	7.05	15.2
	0.715	0.594	0.713	0.609	12.85	2.959	7.205	7.3	2	7.05	15.8
Sample No	0.715 KS-04	0.594 R-01	0.713 KS-1	0.609	13.85 R-02	1.959 R-05	7.205 R-04	7.3 R-05	8	-06	R-07
Sample No	0.715 KS-04	0.594 R-01	0.713 KS-1	0.609	13.85 R-02	2.959 R-05	7.205 R-04	R-05	2 R	-06	R-07
Sample No	0.715 KS-04 52.3	0.594 R-01 55.95	0.713 KS-1 53.1	0.609	13.85 R-02 84	1.959 R-05 66.25	7.203 R-04 43.45	R-05	72 R- 47	-06	8-07 63.51
Sample No SIO ₁ TIO ₂	0.715 KS-04 52.3 0.975	0.594 R-01 55.95 0.75	0.713 KS-1 53.1 0.73	0.609	13.85 R-02 84 9 56 9	2.959 R-03 66.25 0.506	7.203 R-04 45.45 1.11	7.3 R-05 63.35 0.735	72 R- 47 0.0	7.05 -06 .91 643	8-07 63.51 1.07
Sample No SIO: TIO: Al;O;	0.715 9K5-04 52.3 0.975 22.3	0.594 R-01 55.95 0.75 17.69	0.713 KS-1 55.1 0.72 15	0.609 3 1 45 5 0.1 13	13.15 R-02 56 4 .1 2	2.959 R-05 05.25 0.506 23.26	7.205 R-04 45.45 1.11 15.05	7.3 R-05 43.38 0.735 25.56	72 8- 47 0.6 16	7.05 -06 .91 545 5.5	8-07 43.81 1.07 20.57
Sample No <u>90;</u> T10; <i>M</i> ₂ 0; Fa-0;	0.715 KS-04 52,3 0.975 22,3 8,25	0.594 R-01 55.95 0.75 17.69 6.24	0.713 KS-1 55.1 0.73 15 9.4	0.609 3 45 5 0.1 13 13	13.85 R-02 84 56 1	2.959 R-03 05.25 0.506 23.26 6.097	7.203 R-04 43.45 1.11 15.05 12.61	7.3 R-05 43.35 0.735 25.56 7.45	72 8- 47 0.4 16	-06 .91 643 1.5	8-07 43.81 1.07 20.57 10.67
Sample No SIO: TIO: M;O: Fe;O: Fe;O:	0.715 KS-04 52.3 0.975 22.3 8.25	0.594 R-01 55.95 0.75 17.69 6.24	0.713 KS-1 55.1 0.73 15 9.4	0.609 3 45 5 0.1 12 13	13.85 R-02 84 56 1	2.959 R-03 05.25 0.506 23.26 6.097 0.006	7.203 R-04 63.65 1.11 15.05 13.61	7.3 R-05 42.25 0.725 25.56 7.45 0.55	72 R- 47 0.6 16 5.1	7.05 -06 .91 643 643 643 643 643	8-07 43.51 1.07 20.57 10.67
Sample No SIO: TIO: MiO: Fe;O: MaQ	0.718 KS-04 52.3 0.973 22.3 8.25 0.359	0.594 R-01 55.95 0.75 17.69 6.24 0.121	0.713 865-1 55.1 0.73 15 9.4 0.21	0.609 3 45 5 0.1 13 13 0.3	13.85 13.85 R-02 56 1 1 1 1 1 1 1 1 1 1 1 1 1	2.959 8-05 46.25 0.506 23.26 6.097 0.026	7.203 R-04 42.45 1.11 15.05 12.61 0.144	7.3 R-05 42.25 0.725 25.56 7.45 0.074	72 R 47 0.4 16 5.1 0.1	7.05 -06 .91 663 8.5 555 556 196	8-07 65.51 1.07 20.57 10.67 0.127
Sample No \$101 TiO1 MgO1 FegO1 MgO	0.715 KS-04 52.3 0.973 22.3 8.25 0.259 2.92	0.594 R-01 55.95 0.75 17.69 6.24 0.121 2.971	0.713 KS-1 53.1 0.72 18 9.4 0.21 3.95	0.609 3 45 5 0.1 13 13 0.3 5 5 13 13 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	13.85 13.85 R-02 84 1 1 1 1 1 1 1 1 1 1 1 1 1	2.959 R-03 46.25 0.506 23.26 6.097 0.056 6.263	7.205 R-04 65.65 1.11 15.05 13.61 0.166 7.511	7.3 R-05 43.38 0.725 25.56 7.45 0.074 3.53	72 R 47 0.6 16 5.1 0.1 7.1	7.05 -06 .91 663 8.5 556 196 741	8-07 65.51 1.07 20.57 10.67 0.127 6.297
Sample No S(O ₂ T(O ₂ M ₂ O ₂ Fe ₁ O ₂ M ₂ O C ₁ O	0.715 KS-04 52.3 0.973 22.3 5.25 0.259 2.92 7.39	0.594 R-01 55.95 0.75 17.69 6.24 0.121 2.971 5.425	0.713 KS-1 53.1 0.72 18 9.6 0.21 2.92 7.51	0.609 3 :: 45 5 0.: 13 13 13 0.3 5 : 9.6	13.85 R-02 84 56 11 12 84 56 13 11 13 11 13 11 13 11 13 11 13 13 13	2.959 R-03 66.25 0.506 23.26 6.097 0.056 6.263 11.34	7.205 R-04 43.45 1.11 15.05 13.61 0.164 7.511 11.33	7.2 R-05 43.35 0.735 25.56 7.45 0.074 3.53 13.27	72 82- 47 0.4 16 5.1 0.7 7.7 5.4	7.05 -06 .91 563 55 196 196 741 596	8-07 62.81 1.07 20.57 10.67 0.127 6.297 11.89
Sample No S(0) T(0) Alg(0) Fe(0) Ma(0) Mg(0) Ca(0) Na-0	0.718 KS-04 52.3 0.973 21.3 8.25 0.359 2.92 7.39 2.69	0.594 8-01 55.95 0.75 17.69 6.26 0.121 2.971 5.425 4.054	0.713 KS-1 53.1 0.73 18 9.6 0.21 2.95 7.51	0.609 3 45 5 0.1 13 13 13 0.2 5 8 9.6 7 1 13 13 13 13 13 13 13 13 13 1	13.85 R-02 56 11 56 56 11 12 12 12 12 12 12 12 12 12 12 12 12	2.959 R-03 46.25 0.506 23.26 6.097 0.086 6.263 11.34 3.01	7.205 8-04 45.45 1.11 15.05 13.61 0.144 7.511 11.23 1.6	7.2 8-05 42.35 0.735 25.56 7.45 0.074 3.52 13.27 1.79	72 R- 477 0.4 14 5.1 0.1 7.7 5.4 2	7.05 -06 .91 563 55 196 196 741 596 63	13.5 R-07 62.51 1.07 20.57 10.67 0.127 6.127 11.59 2.65
Sample No <u>\$20;</u> Ti0; <u>Ju</u> ₂ 0; Fe;0; Ma0 <u>Mg0</u> <u>Ca0</u> Na ₂ 0 Na ₂ 0	0.718 KS-04 52.2 0.9773 22.3 8.25 0.259 2.92 7.39 2.69	0.594 R-01 55.95 0.75 17.69 6.26 0.121 2.971 5.435 4.034	0.713 KS-1 53.1 0.73 18 9.4 0.21 2.95 7.51 1.916	0.609 3 13 45 5 0.3 13 13 13 13 5 5 5 6 5 0.3 13 13 13 13 13 13 13 13 13 1	13.85 R-02 84 55 11 13 56 12 11 15 15 15 15 15 15 15 15 15 15 15 15	2.959 R-03 46.25 0.506 23.26 6.097 0.026 6.263 11.24 3.01	7.205 R-04 43.45 1.11 15.05 13.61 0.144 7.511 11.33 1.6 0.494	7.2 R-05 43.35 0.735 25.56 7.45 0.074 3.53 13.27 1.79 1.79	72 R- 477 0.4 16 5.1 0.1 7.7 5.0 5.0	7.05 -06 .91 563 5.5 196 196 196 196 595 63	13.5 R-07 43.51 1.07 20.57 10.67 0.127 6.297 11.89 2.65 0.997
Sample No SIO: TIO: AlcO: Fe;O: MaO MgO CiO NacO NacO K;O	0.718 KS-04 52.3 0.973 22.3 8.25 0.259 2.92 7.99 2.69 2.26	0.594 8-01 55.95 0.75 17.69 6.24 0.121 2.971 5.435 4.034 2.33	0.713 KS-1 55.1 0.72 18 9.4 0.21 2.92 7.51 1.99 4.27	0.609 5 1 455 5 0.5 13 13 13 0.5 5 9.6 7 1.5	13.85 R-02 56 66 11 13 56 13 13 13 13 14 15 15 15 15 15 15 15 15 15 15 15 15 15	2.959 R-03 46.25 0.506 23.26 6.097 0.056 6.263 11.34 3.01 0.331	7.205 8-04 62.45 1.11 15.05 13.61 0.144 7.511 11.33 1.6 0.405	7.2 8-05 63.35 0.735 25.56 7.45 0.074 3.53 13.27 1.79 0.291	72 R- 477 0.4 16 5.1 7.5 5.6 2.1 1.	7.05 -06 .91 643 8.5 196 196 741 696 63 15	13.3 R-07 62.51 1.07 20.57 10.67 0.127 6.297 11.59 2.65 0.596
Sample No SIQ: TIQ: MaQ MaQ CaQ CaQ Na;Q K;Q F;Q;	0.718 K5-04 52.2 0.973 22.3 8.25 0.259 2.92 7.39 2.69 2.26 0.247	0.594 R-01 55.95 0.75 17.69 6.24 0.121 2.971 5.435 4.054 2.33 0.285	0.713 KS-1 53.1 0.73 15 9.4 0.21 2.95 7.51 1.90 4.27 0.40	0.609 5 12 655 5 0.1 13 13 13 0.5 5 5 9.6 7 1.1 2 0.6	12.85 R-02 86 55 05 121 8 8 125 125 125 125 125 125	2.959 B-05 46.23 0.506 23.26 6.097 0.056 6.265 11.34 3.01 0.331 0.057	7.205 R-04 45.45 1.11 15.05 13.61 0.164 7.511 11.33 1.6 0.405 0.062	7.2 R-05 45.35 0.725 25.56 7.45 0.074 3.52 13.27 1.79 0.291 0.06	72 R- 477 0.4 16 5.1 7.5 5.6 2.1 1.1 0.3	7.05 -06 .91 643 556 196 741 596 63 15 123	13.2 R-07 62.51 1.07 20.57 10.67 0.127 6.297 11.59 2.65 0.596 0.11
Sample No SiO: TIO: MgO Fe;O; MgO C1O Nb;O Fo;O; Fo;O; Total	0.718 NS-04 52.2 0.973 22.3 8.25 0.259 2.52 7.39 2.69 2.26 0.247 99.79	0.594 R-01 55.95 0.75 17.69 6.26 0.121 5.435 4.034 2.33 0.285 95.51	0.713 KS-1 53.1 0.73 13 9.4 0.21 3.95 7.51 1.95 4.27 0.60 99.7	0.409 3 45 5 0.: 13 13 13 13 13 13 13 13 13 13	13.85 R-02 84 55 56 55 56 55 56 55 56 55 56 55 56 55 56 55 55	2.959 R-03 46.25 0.506 23.26 6.097 0.086 6.263 11.24 3.01 0.331 0.087 97.26	7.205 P-04 62.45 1.11 15.05 13.61 0.144 7.511 11.33 1.6 0.405 0.062 97.33	7.2 8-05 42.25 0.725 25.56 7.45 0.074 3.55 13.27 1.79 0.291 0.06 96.16	72 8- 477 0.4 16 5.1 0.1 7.7 5.6 2.1 1.1 0.2 94	7.05 -06 .91 543 195 195 741 595 63 15 223 .27	13.3 R-07 62.51 1.07 20.57 10.67 0.127 6.297 11.59 2.65 0.596 0.11 97,79
Sample No 20: 110; 40;0; Fe;0; Mg0 C10 Nb;0 F;0; F;0; Tstal	0.718 K5-04 52.3 0.973 22.3 8.25 0.259 2.92 7.29 2.69 2.26 0.247 59.79 2.92	0.594 R-01 55.95 0.75 17.69 6.24 0.121 2.971 5.435 4.034 2.33 0.285 82.51 1.295	0.713 KS-1 53.1 0.72 15 9.4 0.21 2.95 7.51 1.95 4.27 0.60 59.1	0.609 3 13 45 5 0.1 13 13 0.5 5 8 9.6 1.1 2 0.6 6 96 6 96	12.85 R-02 24 56 11 25 12 12 12 12 12 12 12 12 12 12	2.959 8-05 66.25 0.506 23.26 6.097 0.026 6.263 11.34 3.01 0.331 0.087 97.26	7.205 R-04 45,45 1.11 15.05 13.61 0.144 7.511 11.53 1.6 0.405 0.062 \$7,535 1.255	7.2 8-05 42.25 0.725 25.56 7.45 0.074 3.52 13.52 1.79 0.291 0.06 96.16 1.655	72 8- 477 0.4 14 5.1 0.1 5.1 2.1 1.1 0.2 2.1 2.1 1.1 0.2 2.1 1.1 0.2 2.1 1.1 0.2 1.1 1.1 0.2 1.1 1.1 0.2 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1	7.05 -06 .91 643 196 196 741 596 63 15 222 .27	13.3 R-07 43.51 1.07 20.57 10.67 0.127 6.297 11.89 2.65 0.596 0.11 87.79 1.189 1
Sample No 201 110; 41;01 Fe;01 Mit0 Ca0 Na;0 F;0; F;0; F;0; Tistal A/CNK	0.718 K5-04 52.2 0.973 2.23 8.25 0.259 2.59 2.59 2.269 2.269 2.269 2.269 1.507	0.394 R-01 55.95 0.75 17.49 6.24 0.121 2.971 5.435 4.034 2.33 0.385 95.81 1.499	0.713 KS-1 53.1 0.73 9.6 0.21 2.92 7.51 1.90 4.27 0.60 99.7 1.30	0.609 3 (3) 45 5 (3) 13 13 13 13 13 13 13 13 13 13	13.85 R-02 56 13.85	2.959 R-03 46.25 0.505 23.25 6.097 0.0555 2.263 11.34 3.01 0.331 0.331 0.057 97.26 1.554	7.205 R-04 <u>62.45</u> 1.11 15.05 13.61 0.164 7.511 11.53 1.6 0.405 0.062 97.33 1.355	7.2 8-05 43.35 0.735 25.56 7.45 0.074 3.52 13.27 1.79 0.291 0.06 96.14 1.665	72 R- 477 0.4 16 5.1 0.1 5.4 2.1 1.1 0.2 2.1 1.2 94 1.2	7.05 -06 .91 643 155 196 196 196 63 13 13 123 .27 122	13.3 R-07 43.81 1.07 20.57 10.67 0.127 6.297 11.89 2.65 0.596 0.11 97.79 1.359
Sample No 30: 110; 41;0; Fe;0; Ma0 Mg0 C10 Nb;0 K;0 F:9; Total 4/CNK 4/NK	0.718 K5-04 52.2 0.973 2.23 3.25 0.259 2.52 7.39 2.69 2.69 2.69 1.807 4.505	0.594 R-01 55.95 0.75 0.76 0.121 2.971 5.435 4.034 2.33 0.335 95.81 1.499 2.779	0.713 KS-1 55.1 0.73 18 9.4 0.21 1.99 4.27 0.60 9.9.7 1.39 9.9.7 1.39 9.9.7 1.39 9.9.7 1.39 9.9.7 1.59 9.4 1.59	0.609 3 (1) 45 5 (1) 13 13 13 13 13 13 13 13 13 13	17.82 R-02 84 55 11 13 13 14 15 15 15 15 15 15 15 15 15 15	2.959 R-03 46.28 0.506 23.26 6.097 0.086 6.263 11.36 7.01 0.331 0.087 97.26 1.554 6.961	7.205 R-04 62.45 1.11 15.61 0.144 7.511 11.23 1.6 0.405 0.062 97.23 1.355 9.017	7.2 8-05 43,38 0.725 0.725 0.074 3.55 13.27 1.79 0.291 0.06 96.14 1.665 12.55	72 R- 477 0.4 16 5.1 7.1 5.0 2.1 1.1 0.3 94 1.1 94 1.1	7.05 -06 .91 643 196 196 196 196 63 15 123 .27 122 165	13.3 R-07 43.51 1.07 20.57 10.67 0.127 6.297 11.59 2.65 0.11 97.79 1.259 6.227
Sample No 201 110; 41;0; Fe;0; Ma0 Mg0 Co Co Na;0 F;0; F;0; Total A/CNK A/NK A/NK	0.718 K5-04 52.3 0.975 22.3 5.25 0.359 2.92 7.39 2.69 2.69 2.26 0.247 99.79 1.507 4.505	0.594 8-01 55.95 0.75 17.69 6.24 0.121 2.971 5.625 4.034 2.33 0.235 95.81 1.699 2.779	0.713 KS-1 53.1 0.73 15 9.64 0.21 1.95 1.95 0.60 9.75 1.30 0.60 9.75 1.30 0.60 9.75 1.30 0.60 9.75 1.30 0.60 0	0.609 3 11 455 5 0.1 13 13 13 13 13 13 13 13 13 1	13.83 R-02 56 56 11 13.83 56 56 55 56 55 56 56 56 56 56	2.959 R-03 66.25 0.506 6.097 11.34 3.01 0.056 6.263 11.34 3.01 0.057 P7.26 1.534 6.961 1.534	7.205 R-04 45.45 1.11 15.05 1.56 1.65 1.65 0.062 97.53 1.255 9.017 -	7.2 8-05 43.35 0.725 25.56 7.45 0.074 3.53 13.27 1.79 0.291 0.06 96.14 1.665 12.25	72 R- 47. 0.4 16 5.1 7.7 5.6 2.1 1. 0.3 5.6 1.2 1. 0.3 54 1.3 6.4 3 6.4 3 6 4.3 6 7 4.3 6 7 8 4 3 7 8 4 7 7 7 7 8 7 8 7 7 7 8 7 7 7 8 7 7 7 7	7.05 -06 .91 543 556 195 195 195 15 223 15 223 223 245 244	13.2 R-07 42.51 1.07 20.57 10.67 0.127 6.297 11.59 2.65 0.595 0.11 97.79 1.259 6.237 0.595
Sample No 30: 110; 40;0; Fr;0; Ma0 Mg0 Ca0 Ng0 Kg0 F;0; Total 4/CK 4/NK Sa	0.718 K5-04 52.2 0.973 2.23 8.25 0.259 2.52 7.39 2.69 2.69 2.69 0.247 59.75 1.807 4.505 - -	0.594 8-01 55.95 0.75 17.69 6.24 0.121 2.971 5.625 4.034 2.33 0.255 95.81 1.459 2.779 2.779	0.713 KS-1 53.1 0.73 15 9.64 0.21 2.53 1.59 4.27 0.60 9.7 1.20 0.59 1.59 0.5	0.609 3 11 45 5 0.1 13 13 13 13 13 13 13 13 13 1	17.83 R-02 84 55 56 57 58 58 58 58 58 58 58 58 58 58	2.959 R-05 66.25 0.506 23.26 6.067 0.086 6.265 11.34 0.301 0.331 0.037 77.26 6.961 1.554 6.961	7.205 R-04 45.45 1.11 15.05 1.5.05 1.5.01 1.35 0.164 0.405 0.405 0.405 97.33 9.017 -	7.2° R-05 43.28 0.725 25.56 7.45 0.076 2.55 13.27 1.79 0.191 0.0591 0.0591 1.665 12.28 1.27	72 R- 477 0.4 16 5.1 2.4 1.7 5.4 2.4 1.7 5.4 2.4 1.7 5.4 1.7 5.4 1.7 5.4 1.7 5.4 1.7 5.4 1.7 5.4 1.7 5.4 1.7 5.4 1.7 5.4 7 7.7 5.4 7 7.7 5.4 7 7.7 5.4 7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7 7.7	7.05 -06 .91 543 555 196 741 596 63 15 122 .27 122 145 144 545 144	13.2 R-67 42.81 1.07 20.57 10.67 0.127 6.297 11.89 2.65 0.596 0.11 97.79 1.259 6.237 0.695 0.595
Sample No 20: 110; 41;0; Fre0; Ma0 Mg0 Co Fre0; Kg0	0.718 K5-04 52.3 0.973 22.3 5.25 0.259 2.92 7.39 2.92 7.39 2.26 99.79 1.507 4.505 3.002	0.594 8-01 55.95 0.75 6.24 0.121 5.435 4.034 2.971 1.499 - - 4.439	0.713 KS-1 53.1 0.73 15 9.64 0.21 2.92 7.51 1.99 4.27 0.69 9.7,51 1.99 4.27 0.69 9.7,51 1.99 4.27 0.59 1.99 4.27 0.59 1.99 4.27 0.59 1.99 4.27 0.59 1.99 4.27 0.59 1.99 4.27 0.59 1.99 4.27 0.59 1.99 4.27 0.59 1.99 4.27 0.59 1.99 4.27 0.59 1.99 4.27 0.59 1.99 4.27 0.59 1.99 4.27 0.59 1.99 4.27 0.59 1.99 4.27 0.59 1.99 4.27 0.59 1.99 4.27 1.99 5.9	0.609 3 11 45 5 0.1 13 13 13 13 13 13 13 13 13 1	13.83 R-02 84 55 56 11 12 13 13 14 56 13 14 15 14 15 15 15 15 15 15 15 15 15 15	2.959 R-03 65.25 0.506 2.37.36 6.097 0.086 8.263 1.34 3.01 0.331 0.331 0.331 0.331 0.331 1.354 6.961 1.573 6.316	7.205 R-04 45.45 1.11 15.05 12.61 0.164 7.511 1.33 1.6 0.062 97.33 1.225 9.017 - 2.199	7.2° R-65 63.35 0.735 25.36 7.45 0.074 3.55 13.27 1.79 0.05 96.14 1.665 12.25 - 1.51	72 88- 477 0.4 16 5.1 7.1 5.4 2.1 1.1 5.4 2.1 1.1 5.4 2.1 1.2 5.4 1.2 5.4 1.2 5.4 1.2 5.4 1.2 5.4	7.05 -06 .91 643 196 196 196 63 195 63 135 123 .27 135 125 145 1665 1665 1665	8.67 8.67 1.07 1.07 1.07 1.67 0.127 1.89 2.63 0.597 1.239 6.237 1.239 0.511 97.79 1.239 6.297 1.239 0.595 2.072
Sample No 90: 110: 41:0: 120: 100: 1	0.718 K:5-04 52.2 0.9773 22.3 8.25 0.259 2.82 7.39 2.69 2.26 0.247 99.79 1.807 4.505 - 3.002 3.837	0.594 8-01 55.95 0.75 17.69 6.54 0.121 2.971 5.635 4.034 2.33 0.235 95.81 1.699 2.779 - - 4.635 5.752	0.713 KS-1 53.1 0.73 1.5 9.4 0.21 1.5 0.5 1.5 0.60 5.6 5.7 1.5 0.60 5.7 1.5 0.60 5.8 5.7 1.5 0.5 1.5 5.7 5.6 1.5 5.7 5.6 1.5 5.7 5.6 1.5 5.7 5.6 1.5 5.7 5.6 1.5 5.7 5.6 1.5 5.7 5.6 1.5 5.7 5.6 1.5 5.7 5.6 1.5 5.7 5.6 5.6 5.6 5.6 5.6 5.6 5.6 5.6	0.609 3 11 45 5 0.0 12 13 13 13 13 13 13 13 13 13 13	17.85 R-02 84 56 11 56 12 13 56 13 14 15 15 16 16 16 16 16 16 16 16 16 16	2.959 R-05 46.25 0.506 23.26 6.067 0.086 6.262 1.1.34 3.01 0.087 1.534 6.961 1.535 6.316 6.316 6.316	7.205 R-04 45.45 1.11 15.05 13.61 0.144 1.65 1.65 0.052 97.32 9.017 - 2.199 3.635	7.2 R-05 41,23 0.773 25,56 7.45 0.076 2,55 13,27 1.79 0.096 96,16 1.665 12,23 - 1.51 2,649	72 R- 47. 0.6 166 5.3 0.3 7.3 5.6 2. 1. 2. 1. 2. 9.4 1.2 9.4 1.2 9.4 1.2 0.3 9.4 1.2 0.4 5.4 1.2 0.4 0.4 1.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0	7.05 -06 .91 543 195 196 63 13 122 13 122 141 15 122 125 125 126 125 126 126 126 126 126 126 126 126	8.47 8.47 1.07 20.57 1.07 2.45 0.127 4.297 1.39 2.45 0.596 0.11 97.79 4.237 0.596 0.596 0.595 2.075 2.691
Sample No 50: 10: 10: 10: 10: 10: 10: 10: 1	0.718 K5-04 52.2 0.973 22.3 8.25 0.259 2.25 2.82 7.39 2.49 2.26 0.247 99.79 1.507 4.505 - 2.002 2.265 0.259 0.247 99.79 1.505 - 2.005 - - - - - - - - - - - - -	0.594 8-01 55.95 0.75 17.69 6.24 0.121 5.435 0.255 85.81 1.459 2.73 0.255 85.81 1.459 - 4.639 - 5.435 5.55 - 5.435 - 5.55 - 5.435 - 5.55 - 5.435 - 5.435 - 5.555 - 5.55 -	0.713 KS-1 55.1 0.73 9.4 0.21 1.99 1	0.609 3 1 45 5 0.5 12 13 13 13 13 13 13 13 13 13 13	13.85 R-02 56 13 13 13 13 15 15 15 15 15 15 15 15 15 15	2.959 R-03 66.25 0.506 22.16 6.097 0.056 6.097 1.2.46 1.3.46 1.3.24 1.3.24 1.5.24 6.961 1.5.84 6.961 1.5.84 6.961 1.5.75 6.316 5.976 7.321	7.202 R-04 45.45 1.11 15.05 13.61 0.165 0.405 97.32 1.255 9.017 - 2.199 2.623	7.2 R-05 45.25 0.725 25.56 7.45 0.775 3.55 13.27 1.79 0.05 S5 .14 1.645 12.25 - 1.51 2.766	72 80 80 16 5.1 0.3 7.5 5.1 0.3 7.5 5.2 1.5 5.4 1.5 5.4 0.3 5.4 0.3 5.4 0.3 5.4 0.3 5.4 0.3 5.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0	7.05 -06 .91 643 1346 1346 1346 1496 741 596 63 145 1222 145 145 145 145 146 145 146 15 145 146 15 15 15 15 15 15 15 15 15 15	8.67 8.67 10.67 10.67 10.67 10.67 10.67 1.67 1.67 1.59 2.65 0.596 0.11 87.79 1.259 6.297 1.359 5.265 2.072 2.695 2.073 2.695 2.073 2.695 2.075 2.695 2.075 2.695 2.075 2.695 2.075 2.695 2.075 2.695 2.075 2.695 2.075 2.695 2.075 2.695 2.075 2.695 2.595 2.555 2.
Sample No 201 110; 41;0; 54;0; Ma0 Mg0 Ci0 Ni;0 K;0 F;0; K;0 F;0; K;0 F;0; K;0 Ci0 K;0 F;0; Ci0 K;0 F;0; F;0; Ci0 K;0 F;0; F;0; Ci0 K;0; F;0; Ci0 K;0; F;0; Ci0 K;0; Ci0 Ci0 K;0; Ci0 Ci0 Ci0 Ci0 Ci0 Ci0 Ci0 Ci0 Ci0 Ci0	0.718 K5-04 55.2 0.9773 22.3 8.25 0.259 2.269 2.26 0.247 99.79 1.507 4.505 - 2.002 2.537 4.505 - 2.002 2.537 4.505 - 2.002 2.537 - 2.505 -	0.594 8-01 55.95 0.75 17.69 6.34 0.121 2.971 5.435 0.285 95.81 1.459 2.779 - - 4.635 5.752 2.779 - - 3.585 5.752 5.752 5.955 - - - - - - - - - - - - -	0.713 KS-1 53.1 0.73 18 9.4 0.31 2.83 7.51 1.99 4.27 0.69 9.57 1.99 4.27 0.69 9.57 1.99 4.27 0.69 9.5 1.99 4.27 0.59 1.99 4.27 1.99 4.49 4.49 4.47 1.99 4.4	0.609 3 1 45 5 0.7 13 13 13 13 13 13 13 13 13 13	17.85 R-02 R-02 R-02 R-02 R-02 R-02 R-02 R-0	2.959 R-03 66.28 0.506 23.16 6.097 0.086 6.263 1.324 3.01 0.087 7.26 1.534 6.961 1.573 6.316 5.976 7.921	7.202 R-04 45.45 1.11 15.05 13.61 0.164 0.164 0.0405 0.405 0.405 0.405 97.22 97.22 97.22 97.22 97.22 97.22 0.405 0.4	7.2 R-05 41,23 0.773 25,56 7.45 0.0776 2,55 13,27 1.79 0.076 2,55 13,27 1.79 0.291 0.056 95,165 12,23 - - - - - - - - - - - - -	72 80 80 16 16 16 16 16 16 16 16 16 16	7.05 -06 .91 643 195 196 196 63 15 15 15 122 141 596 63 15 15 122 145 144 155 156 157 155 156 156 156 156 156 156 156	8.47 8.47 10.57 10.67 20.57 10.67 20.57 11.59 2.45 0.596 0.11 97.79 6.337 0.695 6.337 0.695 2.073 2.691 3.2691 3.2691 3.2691
Sample No 30: 110; 41;0; 14;0; Mg0 C10 Mg0 C10 Ng0 Kg0 F;0; F;0; Kg0 F;0; F;0; Kg0 F;0; F;0; Kg0 F;0; F	0.718 K5-04 52.2 0.973 22.3 8.25 0.259 2.82 7.29 2.69 2.69 2.69 1.807 4.695 0.247 50.505 - 2.002 2.827 3.002	0.594 8-01 55.95 0.75 17.69 6.54 0.121 5.635 0.034 2.971 5.635 0.285 95.51 1.699 - - 4.639 - 5.635 - - - - - - - - - - - - -	0.713 KS-1 53.1 0.72 9.4 0.21 1.92 7.51 1.92 0.21 0.42 7.51 1.92 0.21 0.42 7.51 1.92 0.21 0.21 0.21 1.92 0.21 0.21 0.21 1.92 0.21 0.22	0.609 3 1 45 5 0.1 12 13 13 13 13 13 13 13 13 13 13	13.85 R-02 84 R-02 84 85 8 0 6 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	2.959 R-03 66.25 0.506 23.36 6.097 0.086 6.263 11.34 0.087 F7.36 1.573 6.961 1.573 6.316 5.975 7.321 6.965 1.575 6.316 5.975 7.321 6.965 7.321 6.965 7.321 7.3	7.205 R-04 45.45 1.11 15.05 15.61 0.465 0.405 0.405 0.405 0.405 1.355 9.017 - 2.199 2.655 2.223 0.421	7.2 R-05 45.25 0.775 25.56 7.45 0.775 3.55 13.27 1.79 0.05 96.14 1.665 95.14 1.655 12.23 - 1.51 2.665 - - - - - - - - - - - - -	72 8- 8- 47. 0.3 16 5.1 0.3 7.5 5.6 2.1 1.1 0.3 5.6 2.1 1.1 0.3 5.6 2.1 1.1 0.3 5.6 2.1 0.3 5.6 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3	7.05 -06 .91 643 8.5 196 196 741 596 63 195 135 122 145 145 145 145 145 145 145 145	8.47 8.47 1.07 20.57 10.47 0.427 1.39 2.65 0.11 87.79 1.259 0.595 0.595 0.595 2.072 2.655 2.073 2.254 0.506
Sample No 20, 110, 41,0, Fe,0, Ma0 Mg0 Ca0 Nb;0 F,0, F,0, F,0, F,0, F,0, F,0, F,0, F,	0.718 K5-04 52.3 0.973 22.3 5.25 0.359 2.92 7.39 2.69 2.26 2.92 7.39 2.69 1.507 4.505 - 3.002 3.837 4.695 0.36	0.594 8-01 55.95 0.75 17.69 6.24 2.971 5.425 0.121 2.971 5.425 0.255 95.81 1.439 2.779 - - 4.625 5.557 0.752 0.755 0.752 0.755	0.713 KS-1 52.1 0.72 9.4 0.73 18 9.4 0.73 1.99 4.27 1.99 5.47 1.99 5.47 1.99 5.47 1.99 5.47 1.99 5.47 1.99 5.47 1.99 5.47 5.4	0.609 3 1 45 5 0.1 3 13 13 13 13 13 13 13 13 13 13 13 13 13 1	17.85 R-02 R-02 R-02 R-02 R-02 R-02 R-02 R-02	2.959 R-03 65.25 0.506 23.26 6.097 0.056 6.263 1.34 3.01 0.331 1.34 3.01 0.331 1.34 5.971 1.573 6.316 5.976 7.321 4.705 0.966	7.202 R-04 45.45 1.11 15.05 13.61 0.164 0.065 0.062 97.33 1.6 0.405 97.33 5.017 - 1.235 9.017 - 2.199 2.625 2.199 2.625 0.021 0.207	7.2 R-05 41,23 0.725 25,56 7.45 2,55 0.074 2,55 13,27 1.79 0.291 0.06 95,14 1.665 12,23 - - - - - - - - - - - - -	72 8- 477 0.4 16 5.1 0.1 1. 1. 0.1 5.4 1.1 0.1 0.1 1.1 0.1 0.1 1.1 0.1 0	7.05 -06 .91 643 1.5 126 126 125 123 123 123 124 123 124 123 124 125 124 125 124 125 125 125 125 125 125 125 125	8.67 8.67 10.67 20.57 10.67 20.57 10.67 2.65 0.127 2.65 0.596 0.11 97.79 6.227 1.359 6.327 0.696 1.359 6.327 2.651 2.073 2.651 2.073 2.651 3.659 6.327 3.659 6.327 3.659 6.327 3.659 6.327 3.659 6.327 3.659 6.327 3.659 6.327 3.659 6.327 3.659 6.327 3.659 6.327 3.659 6.327 3.659 6.327 3.659 6.327 3.659 6.327 7.327 7.327 7.359 7.359 7.359 7.559
Sample No SIO: TIO: AlgO: FrigO: MinO MinO MinO MinO MinO KigO FrigO: Total AlgO: KigO FrigO: Total AlgO: KigO FrigO: MinO MinO MinO KigO FrigO: MinO KigO FrigO: MinO KigO FrigO: MinO KigO FrigO: MinO KigO FrigO: MinO KigO FrigO: MinO KigO FrigO: MinO KigO FrigO: MinO KigO FrigO: MinO KigO FrigO: MinO KigO FrigO: MinO KigO FrigO: MinO KigO FrigO: MinO MinO KigO FrigO: MinO MinO MinO KigO FrigO: MinO MinO MinO KigO FrigO: MinO MinO MinO KigO FrigO: MinO Mi	0.718 K5-04 52.2 0.973 22.3 8.25 0.259 2.69 2.69 2.69 0.247 592.79 1.507 4.505 - - - - - - - - - - - - -	0.594 8-01 55.95 0.75 17.69 6.54 0.121 5.625 4.034 1.639 2.571 1.699 - - 4.639 5.752 5.992 2.779 - 0.755 5.992 0.755 5.992 0.755 5.992 0.755 5.992 0.755 5.992 0.755 5.992 0.755 5.992 0.755 5.992 0.755 5.992 0.755 5.992 0.755 5.992 0.755 5.992 0.755 5.992 0.755 5.992 0.755 0.997 0.9	0.713 KS-1 53.1 0.72 9.4 0.21 1.93 1.93 0.21 0.427 0.47	0.609 3 1 45 5 0.1 13 13 13 13 13 13 13 13 13 1	13.85 R-02 84 R-02 84 85 10 13 13 15 15 15 15 15 15 15 15 15 15 15 15 15	2.949 R-03 66.38 6.097 0.086 6.265 11.34 7.06 1.594 1.594 1.594 1.594 1.573 6.316 5.975 6.316 5.975 6.316 5.975 6.316 5.975 6.316 5.976 7.321 6.092	7.202 R-04 45.45 1.11 15.05 13.61 0.164 1.13 1.33 1.6 0.405 0.405 0.405 0.405 0.405 1.355 1.355 1.355 1.355 1.355 1.355 0.405	7.2' 3 -45 41,25 0.725 25,56 7,45 0.745 0.745 0.745 0.757 13,27 1,75 0.2571 0.05 56 ,14 1,615 12 ,235 - 1,51 2 ,645 2 ,766 - 0,255	72 8- 47. 0.4 16 5.1 0.3 7.5 5.6 2.1 1.5 5.6 2.1 1.5 5.6 4.5 5.6 4.5 5.6 4.5 5.6 4.5 5.6 4.5 5.6 5.6 5.6 5.6 5.6 5.6 5.6 5	7.05 -06 .91 .91 .043 .5 196 .5 196 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5	8.47 8.47 1.07 20.57 1.07 2.057 1.27 2.45 0.11 57.79 1.259 2.455 2.075 2.695 2.0595 2.695 2.695 2.554 0.595 0.464
Sample No 20: 110: 120: Fr:0: Mis0 Mis0 Ni;0 F:0: F:0: F:0: F:0: F:0: F:0: F:0: F:	0.718 K5-04 52.3 0.973 22.3 5.25 0.259 2.92 7.39 2.92 7.39 2.26 99.79 1.507 4.505 5.002 2.837 4.695 0.905 0.366 0.754 0.719	0.594 8-01 55.95 0.75 17.69 6.24 0.121 2.971 5.425 4.034 2.37 95.81 1.499 - 4.639 5.952 0.75 5.952 0.75 95.81 1.499 0.75 5.952 0.75 95.81 0.75 95.81 0.75 95.81 0.75 95.81 0.75 95.81 0.75 95.81 0.75 95.81 0.75 95.81 0.75 95.81 0.75 95.85 0.75 0.75 95.85 0.75 0.75 95.85 0.75 0.75 0.75 95.85 0.75 0.59 0.75 0.75 0.59 0.75 0.59 0.75 0.59 0.75 0.59 0.75 0.59 0.75 0.59 0.75 0.59 0.75 0.59 0.75 0.59 0.75 0.59 0.75 0.59 0.75 0.59 0.75 0.59 0.75 0.59 0.75 0.595 0.75 0.595 0.75 0.595 0.75 0.575	0.713 KS-1 53.1 0.73 9.4 0.73 1.5 9.4 0.51 1.99 4.27 0.60 98.7 1.30 2.83 0.59 3.37 5.45 0.53 0.55 0.	0.609 3 11 45 5 0.1 13 13 13 13 13 13 13 13 13 1	13.85 R-02 84 8-02 84 95 95 95 95 95 95 95 95 95 95 95 95 95	2.949 R-03 65.25 0.506 2.37.36 6.097 0.086 6.265 6.265 1.34 3.01 0.321 0.331 0.331 1.34 1.54 6.961 1.554 6.961 1.573 6.216 2.097 97.26 1.554 6.961 1.573 6.216 2.097 0.331 0.097 97.26 1.574 0.097 0.331 0.097 97.26 1.574 0.097 0.331 0.097 97.26 1.574 0.097 0.354 0.375 0.097 0.355 0.305 0.355 0.305 0.355	7.205 R-04 45.45 1.11 11.05 13.61 0.144 7.511 11.33 1.6 0.405 97.33 1.245 1.24	7.2 R-65 45.25 0.725 25.56 7.45 0.074 3.55 13.27 1.79 0.05 96.14 1.665 12.25 - 1.51 2.669 2.766 - 0.295 0.329	72 80 677 0.4 16 16 17 16 16 16 16 16 16 16 16 16 16	7.05 -06 .91 .92 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5	8.67 8.67 1.07 20.57 10.67 20.57 10.57 1.257 2.65 0.596 0.117 2.65 0.596 0.127 2.65 0.596 0.596 0.595 0.595 0.595 0.506 0.507 0.506 0.507 0.507 0.507 0.507 0.507 0.596 0.595 0
Sample No 30: 110; 41;0; 120; 120; 14;0; 10; 10; 10; 10; 10; 10; 10;	0.718 K:5-04 52.2 0.9773 22.3 8.25 0.259 2.82 7.39 2.69 2.85 0.247 59.79 1.807 4.505 - 3.002 2.827 4.695 0.716 0.716 0.716 0.716 0.716 0.716 0.716 0.717 0.259 0.25	0.594 8-01 55.95 0.75 17.69 6.54 0.155 2.971 5.625 4.025 4.025 5.625 95.81 1.699 2.779 - 4.659 5.957 5.957 3.992 0.75 5.957 3.992 0.572 5.972 0.572 5.972 0.757 0.572 0.7577 0.7577	0.713 KS-1 53.1 0.73 9.6 0.21 1.93 1.93 0.60 99.7 1.93 0.60 99.7 1.93 0.69 9.5 1.93 0.69 9.5 1.95 0.65 0.55	0.609 3 1 45 5 0.9 13 13 13 13 13 13 13 13 13 13	17.85 R-02 84 R-02 84 85 85 10 11 13 15 15 15 15 15 15 15 15 15 15 15 15 15	2.949 R-03 66.38 0.506 23.36 6.097 0.086 6.097 0.086 6.265 11.34 3.01 0.037 R.36 6.310 0.037 R.36 6.961 1.572 6.316 5.976 6.316 5.976 6.316 5.972 6.316 5.976 6.316 5.976 6.316 5.976 6.316 5.976 6.316 5.976 6.316 5.976 6.316 5.976 6.316 5.976 6.316 5.976 6.316 5.976 6.316 5.976 6.316 5.976 6.316 5.976 6.31 6.326 6.326 6.32 6.32 6.32 6.32 6.32 6.	7.205 R-04 45.45 111 18.05 13.61 0.144 11.05 13.61 0.0405 0.065 0.065 0.065 1.255 1.255 1.255 0.617 - 1.199 2.655 2.057 0.645 0.20 0.207 0.645 0.20 0.20 0.20 0.20 0.20 0.20 0.20 0.2	7.2 3 -45 41,25 0.773 25,56 7.45 3,55 13,27 1,79 0.0591 0.0591 0.059 11,255 - 1,645 2,766 - 0,295 0,295 0,295 0,295	72 R. 477 0.44 160 0.10 5.1 7.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0	7.05 -06 .91 543 1.5 196 633 15 15 643 15 1223 127 1223 125 141 6596 633 15 166 15 166 17 1223 125 126 126 127 1223 125 126 126 127 127 1223 126 127 127 127 127 127 127 127 127	8.47 8.47 1.67 20.57 1.67 2.65 2.45 0.11 97.79 1.259 2.65 2.055 2.055 2.055 2.055 2.055 2.055 2.055 2.055 2.055 2.055 2.055 2.055 0.11 97.259 3.254 0.506 - - 0.464 0.464 0.457 0.427 0.427 0.595 0.59
Sample No 20: 110: 110: 110: 110: 100: 100: 100:	0.718 8:5-04 52.2 0.973 22.3 8.25 0.259 2.25 2.25 0.259 2.25 0.259 2.25 0.247 99.79 1.507 4.505 - 2.002 2.505 0.905 0.26 0.905 0.905 0.26 0.905 0.754 0.905 0.754 0.719 2.505 0.905 0.754 0.905 0.754 0.755 0.905 0.755 0.905	0.594 8-01 55.95 0.75 17.69 6.24 0.121 5.425 4.024 2.33 0.255 85.81 1.459 - 4.639 - 4.639 - 5.955 1.752 5.975 1.5975 1.5575 1.5	0.713 KS-1 55.1 0.73 9.4 0.21 1.99 4.27 0.62 9.87 1.30 2.99 7.51 1.30 2.99 7.51 1.99 4.27 0.65 9.4 0.57 1.99 4.27 0.65 1.99 1	0.609 33 34 45 5 0.3 5 0.3 5 5 0.3 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	13.85 R-02 84 8-02 84 95 95 95 95 95 95 95 95 95 95 95 95 95	2.939 R-03 65.25 0.506 23.16 6.097 0.056 6.097 0.056 6.097 0.036 1.32 1.32 1.32 1.32 1.32 1.33 1.33 1.53 2.037 77.26 1.53 2.037 77.26 1.53 2.037 2.05 2.097 2.05 2.092 2.092 2.092 2.052 2	7.202 R-04 45.45 1.11 11.22 1.61 0.164 1.51 11.23 1.61 0.405 0.062 97.33 1.355 9.017 - 2.199 2.623 0.507 0.50 0.50	7.2 R-85 45.25 0.725 25.56 7.45 0.775 3.55 13.27 1.79 0.05 S5 .14 1.645 12.25 S 1.51 2.649 2.766 - - - - - - - - - - - - -	72 R. 477 0.6 477 0.6 16 5 5 0.1 7. 7. 7. 7. 7. 7. 7. 7. 7. 7.	7.00 406 (91) 402 403 403 404 405 405 405 405 405 405 405	8.47 8.47 10.57 10.67 10.67 10.67 10.67 1.67 0.127 1.59 0.596 0.596 0.596 0.596 0.595 1.595 2.6595 2.659 2.554 0.606 2.554 0.6664
Sample No 201 110; 41:01 110; 41:01 10; 41:01 Na0 Na0 Na0 Na0 Na0 Na0 Na0 Na0	0.718 K:5-04 52.2 0.9773 22.3 8.25 0.259 2.69 2.69 2.69 1.807 4.505 - 3.002 3.827 4.505 - 3.002 3.827 4.505 0.738 0.746 0.745 0.746 0.746 0.746 0.758 1.807	0.594 8-01 55.95 0.75 17.69 6.54 0.151 2.971 5.625 4.034 2.33 0.235 94.81 1.699 2.779 - 4.639 5.957 5.957 5.972 5.975 1.985 1.9	0.713 KS-1 53.1 0.73 9.6 0.21 1.93 1.93 1.93 0.60 99.7 1.93 0.60 99.7 1.93 0.60 99.7 1.93 0.60 99.7 1.93 0.60 9.5 1.93 0.55 1.95 1.95 1.95 0.65 0.55 0	0.609 3 1 45 5 0.1 13 13 13 13 13 13 13 13 13 1	13.85 R-02 R-02 R-02 R-02 R-02 R-02 R-02 R-02	2.949 R-03 66.38 0.506 13.36 6.097 0.086 6.097 0.086 6.263 11.34 3.01 0.037 F .26 1.534 6.961 1.573 6.316 5.961 1.573 6.316 5.971 6.314 5.971 6.314 5.961 2.092 1.473 2.670 0.986 2.092 1.478 2.361	7.205 R-04 45.45 45.45 111 15.05 13.61 0.144 13.51 1.6 0.405 0.405 0.405 0.405 0.405 1.235 9.017 2.199 2.435 0.621 2.199 0.445 0.625 0.527 0.445 0.52 0.52	7.2 R-05 41.23 0.773 25.56 7.45 0.774 2.55 13.27 1.79 0.291 0.094 1.665 12.25 - 1.51 2.649 2.766 - 0.295 0.295 0.295 - 0.29	72 R. 477 0.4 477 0.4 161 0.0 7.1 7.1 7.2 7.2 7.2 7.2 7.2 7.2 7.2 7.2	7.06 406 (91 405 405 405 405 405 405 405 405 405 405	8.67 8.67 1.07 20.57 1.07 2.65 0.11 97.79 6.297 1.259 6.337 0.695 2.651 2.251 2.655 2.655 2.555 2.655 2.655 2.555 2
Sample No 200: TIO: JigO: MisO MisO CiO Na;O F:O: Total ACNK ANK Sa Ci Ci Ra Ra Ra Ra Mo Sa Fib Ga Za	0.718 8(5-04 52.2 0.973 22.3 8.25 0.259 2.25 2.82 7.39 2.49 2.26 0.247 99.79 1.807 4.505 - - 2.002 2.827 2.605 0.247 99.79 1.807 4.505 0.365 0.365 0.365 0.365 0.754 0.754 0.719 4.032 1.575 10.39	0.594 8-01 55.95 0.75 6.54 0.121 5.635 0.026 2.971 1.699 - 0.285 95.81 1.499 - 0.752 5.955 0.752 5.9575 1.9555 4.855	0.713 KS-1 53.1 0.73 9.4 0.21 1.93 9.4 0.21 1.93 1.93 9.4 0.21 1.93 1.95	0.609 3 11 45 5 0.1 12 13 13 13 13 13 13 13 13 13 13	13.85 R-02 84 8-02 84 95 95 95 95 95 95 95 95 95 95 95 95 95	2.949 R-03 66.28 0.506 23.16 6.097 0.056 6.097 0.056 6.097 11.24 1.324 1.324 1.534 6.961 1.584 6.961 1.584 6.961 1.573 6.316 6.975 1.475 6.316 6.96 2.94 1.673 1.475 1.4	7.202 R-04 45.45 1.11 11.23 13.61 0.405 0.405 0.405 0.405 97.33 1.355 9.017 - 2.199 2.625 0.621 0.407 0.409 0.599 1.416 0.649 0.64 0.64 0.64 0.64 0.64 0.64 0.64 0.64	7.2 R-85 45.25 0.725 25.56 7.45 0.775 3.55 13.27 1.79 0.06 S5 .14 1.605 1.51 2.465 1.51 2.465 1.51 2.465 0.725 0.555 0.525 0.555 0.555 0	72 R- 477 0.6 477 0	7.08 7.09 7.09 7.01 7.01 7.01 7.02 7.02 7.02 7.02 7.02 7.02 7.02 7.02	8.67 8.67 20.57 10.67 20.57 10.67 2.65 0.596 0.596 0.596 0.596 0.596 0.595 2.655 2.073 2.655 2.073 2.656 0.695 2.050 0.506 - 0.506 - 0.506 - 0.505 - 0.595 0.505 0.505 0.505 0.505 0.505 0.505 0.505 0.557
Sample No 201 110; 41;01 Fr;02 Ma0 Mg0 C10 N3;0 F;02 F;02 F;02 F;02 F;02 F;02 F;02 F;	0.718 K:5-04 53.2 0.9773 22.3 8.25 0.259 2.69 2.69 2.69 1.807 4.505 - 3.002 3.827 4.505 - 3.002 3.827 4.505 0.718 0.718 0.718 0.747 1.807 1.875 1.877	0.594 8-01 55.95 0.75 17.69 6.54 0.121 2.971 5.625 0.235 95.81 0.235 95.81 1.699 2.779 - - 0.591 1.695 2.595 0.75 2.595 1.9555 1.9555 1.9555 1.95	0.713 KS-1 53.1 0.73 9.4 0.21 1.93 1.93 1.93 0.60 99.7 1.93 0.60 99.7 1.93 0.60 99.7 1.93 0.60 99.7 1.93 0.60 9.5 1.93 0.65 0.55 0.65 0.65 0.65 0.65 0.55 0.65 0.55 0	0.609 3 1 45.5 5 0.5 5 0.5 5 5.0 13 13 13 13 13 13 13 13 13 13 13 13 14 5.6 5 5.	17.85 R-02 R-02 R-02 R-02 R-02 R-02 R-02 R-02	2.959 R-03 66.38 0.506 13.36 6.097 0.086 6.097 0.086 6.263 11.34 3.01 0.031 1.574 5.961 1.574 6.961 1.574 6.961 1.574 6.961 1.574 6.961 2.072 1.674 6.96 2.092 1.478 2.361 2.73 2.65 2.092 2.341 6.573 2.012 2.041 2.3	7.205 R-04 45.45 1.11 15.05 13.61 0.164 1.61 0.062 97.32 1.6 0.605 97.32 1.235 9.017 2.199 2.195 2.125 0.622 2.195 0.625 4.765 0.64 0.645 0.	7.2 R-05 41,23 0.773 25,56 7.45 2,55 13,27 1,25 0.291 0.05 95,14 1.665 12,23 - 1.51 2.665 2.766 - .515 0.295 0.295 0.505 - .215 0.505 - .215 0.505 - .215 0.505 - .215 0.505 - .215 .276 .275 .276 .275 .276 .275 .276 .275 .275 .275 .276 .275 .275 .275 .276 .275 .27	72 R- 477 0.6.6 477 0.7 477 0.7 5 6 6 5 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	7.08 46 51 51 64 53 55 64 5 65 65 65 65 65 65 65 65 65 65 65 65 6	8.67 8.67 1.07 20.57 1.07 2.057 1.27 6.297 1.89 2.695 0.596 0.596 0.596 0.596 0.596 0.596 0.596 0.596 0.595 0
Sample No SQL SQL SQL Frequencies Mato Mato Nago KgO Frou ACNK ACNK ACNK ACNK ACNK ACNK ACNK ACNK	0.718 K5-04 52.2 0.973 22.3 8.25 0.259 2.82 7.39 2.69 2.79 2.69 2.69 2.69 2.79 2.69 2.69 2.79 2.69 2.	0.594 8-01 55.92 0.75 17.69 6.24 0.121 5.635 4.034 2.571 1.679 2.775 2.595 - .635 0.225 5.635 5.635 0.225 5.635 5.655 5.6	0.713 KS-1 53.1 0.72 9.4 0.21 1.57 0.60 58.7 1.50 1.50 1.50 1.50 1.50 1.57 1.57 0.65 0.65 0.65 1.57 1	0.609 3 1 4 65 5 0.0 13 13 14 65 5 0.0 13 13 13 13 13 13 13 13 13 13 13 13 13	13.83 R-02 84 R-02 84 85 8 13 13 13 14 15 15 15 15 15 15 15 15 15 15 15 15 15	2.959 R-03 65.25 0.506 23.36 6.097 0.056 6.097 0.056 6.263 11.34 0.037 7.36 1.573 6.316 6.961 1.574 6.961 1.575 6.316 6.961 1.575 6.316 6.961 1.575 6.316 6.961 1.575 6.316 6.961 1.575 6.316 6.961 1.575 6.316 6.961 1.575 6.316 6.961 1.575 6.316 6.96 1.575 6.31 6.96 1.575 6.31 6.975 6.31 6.975 6.31 6.975 6.31 6.975 6.31 6.975 6.31 6.975 6.31 6.975 6.32 6.975 6.31 6.975 6.31 6.975 6.31 6.975 6.31 6.975 6.31 6.975 6.31 6.975 6.31 6.975 6.31 6.975 6.31 6.975 6.31 6.975 6.31 6.975 6.31 6.975 6.31 6.975 6.31 6.975 6.31 6.975 6.01	7.105 R-04 45.45 1.11 15.05 13.61 0.465 0.	R-45 52,25 0.725 25,56 7,45 0.725 2,55 13,27 1,79 0.591 0.06 96,14 1,655 12,255 0.595	72 R- 477 0.6 164 0.7 7.0.5 8.5 9.5 9.5 9.5 9.5 9.5 9.5 9.5 9.5 9.5 9	7.08 7.09 7.09 7.09 7.09 7.09 7.09 7.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0	8.67 8.67 10.57 10.67 10.67 10.67 1.67 1.67 1.69 1.69 0.596 0.11 57.79 1.259 0.595 0.11 57.79 1.255 0.695 2.075 2.655 2.075 2.655 2.075 2.655 2.075 2.655 2.075 2.655 2.055 2.055 2.055 2.075 2.655 2.075 2.655 2.075 2.655 2.075 2.655 2.075 2.655 2.075 2.655 2.075 2.655 2.075 2.655 2.075 2.655 2.075 2.655 2.075 2.655 2.075 2.655 2.075 2.655 2.075 2.655 2.075 2.655 2.075 2.655 2.075 2.655 2.075 2.655 2.075 2.655 2.055 2.055 2.075 2.655 2.075 2.655 2.075 2.655 2.075 2.655 2.0
Sample No 201 110; 41;01 Fr;02 Ma0 Nb;0 K;0 Fr;0; K;0 Fr;0; K;0 Fr;0; K;0 Fr;0; K;0 Fr;0; K;0 Fr;0; Ca Ra Ra Ra Ra Sa Fr Ga Ca Nb; Ca Sa Sa Sa Sa Sa Sa Sa Sa Sa Sa Sa Sa Sa	0.718 K:5-04 55.2 0.9773 22.3 8.25 0.259 2.82 7.39 2.69 2.26 0.247 99.79 1.507 4.505 - 3.002 2.827 4.505 0.719 0.247 9.505 0.739 1.507 4.505 0.739 1.507 4.505 0.739 1.507 1.575 1.57	0.594 8-01 55.95 0.75 17.69 6.34 0.121 2.971 5.625 0.235 95.81 1.699 2.779 - 0.597 5.987 0.751 1.985 4.556 0.7 1.985 4.556 0.7 1.985	0.713 KS-1 53.1 0.72 9.4 0.21 1.92 1.92 0.60 99.7 1.92 0.60 99.7 1.92 0.60 99.7 1.92 0.60 99.7 1.92 0.60 99.7 1.92 0.60 9.4 0.53 1.93 0.65 9.4 0.55 1.95 0.65 9.55 1.95 0.65 0.55 1.95 0.65 0.55 1.97 0.65 0.55 1.95 0.65 0.55 1.97 0.65 0.55 1.95 0.55 1.95 0.55 1.95 0.55 1.95 0.55 1.95 0.55 1.95 0.55 1.95 0.55 1.95 0.55 1.95 0.55 1.95 0.55 1.95 0.55 1.95 0.55 1.95 0.55 0.55 1.95 0.55 1.95 0.55 0.55 0.55 1.97	0.609 3 1 4 65 5 0.5 5 0	13.85 R-02 84 56 13.1 56 14 56 15 5 6 5 5 6 5 5 5 5 5 5 5 5 5 5 5 5	2.959 R-03 66.38 0.506 13.36 6.097 0.086 6.097 0.086 6.263 11.34 3.01 0.037 7.26 1.573 6.361 1.574 6.961 1.573 6.316 5.975 6.318 5.975 6.318 5.975 7.321 4.705 0.986 2.092 1.473 2.454 5.971 5.73 5.575 5.73 5.73 5.73 5.73 5.73 5.7	7.205 R-04 45.45 1.11 15.05 13.61 0.164 1.61 0.405 0.062 97.33 1.6 0.405 0.062 97.33 2.199 1.225 9.017 2.199 2.199 2.139 0.623 3.235 0.627 0.649 0.535 4.765 3.065 1.416 0.635 4.765 3.065 1.416 0.635 4.765 3.065 1.416 0.635 4.765 3.065 1.416 0.635 4.765 3.065 1.416 0.635 4.765 3.065 3.521 4.55 4.765 3.065 4.76 4.76 4.76 4.76 4.76 4.76 4.76 4.76	7.2 R-05 41,23 0.773 25,56 7.45 2,55 13,27 1,25 0,291 0,05 96,14 1,645 12,23 - 1,51 2,766 - 1,51 2,766 - 1,51 2,766 - 1,51 2,766 - 1,51 - 1,55 - - - - - - - - - - - - -	72 R- 477 0.4.4 477 0.4.4 477 0.4 477 0.7 1.6 1.6 1.7 1.6 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7	7.08 7.09 7.09 7.09 7.01 7.01 7.01 7.01 7.01 7.01 7.01 7.01	8.67 8.67 10.67 20.57 10.67 20.57 10.67 20.57 11.59 2.65 0.11 97.79 6.327 0.695 2.691 2.695 2.691 2.695
Sample No SQ: TIO: HigO FriO: MaO MigO Co Na;O KgO FriO: Frid Ra Ra Ra Ra Ra Ra Ra Ra Ra Co Sa Sa Sa Co Sa Co Sa Sa Sa Co Sa Co Sa Co Sa Co Sa Co Sa Sa Sa Sa Sa Sa Sa Sa Sa Sa Sa Sa Sa	0.718 8(5-04 52.2 0.973 22.3 8.25 0.259 2.92 7.39 2.69 2.79 2.69 2.69 2.69 2.79 2.69 2.69 2.69 2.69 2.69 2.69 2.69 2.69 2.69 2.69 2.69 2.69 2.69 2.69 2.71 2.69 2.69 2.69 2.71 2.69 2.69 2.71 2.69 2.69 2.71 2.69 2.69 2.71 2.69 2.69 2.71 2.69 2.69 2.69 2.71 2.69 2.69 2.71 2.69 2.69 2.71 2.69 2.69 2.71 2.69 2	0.594 8-01 55.95 0.75 17.69 6.54 0.121 5.635 4.034 1.297 2.575 2.575 3.992 0.77 3.992 0.77 3.992 0.77 3.992 0.77 3.992 0.75 5.975 1.985 4.556 4.5	0.713 KS-1 53.1 0.72 9.4 0.21 1.57 1.57 0.60 5.27 0.60 5.27 0.60 5.27 1.57 0.65 0.65 0.65 0.65 1.57 1	0.609 13 1 45 0.1 17 1.2 18 3.1 9.6 9.6 17 1.7 18 3.1 9.6 9.6 19 0.2 10 2.1 6	13.83 R-02 84 R-02 84 85 8 13 1 13 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	2.959 R-03 66.28 0.506 23.36 6.097 0.086 6.263 11.34 3.01 0.087 P 7.36 1.573 6.316 6.961 1.573 6.316 6.961 1.575 6.316 6.961 1.575 6.316 6.961 1.575 6.316 6.961 1.575 6.316 6.961 1.575 6.316 7.926 7.996 7.996	7.202 R-04 45.45 111 15.05 13.61 0.465 0.4	7.2 R-05 45.25 0.725 25.56 7.45 0.725 13.27 1.75 0.259 0.259 0.259 1.225 - 1.51 2.469 2.766 - 0.259	72 R- 677 0.64 677 0.64 8.1 8.1 8.1 9.1 8.4 9.1 9.4 9.4 9.4 9.4 9.4 9.4 9.4 9.4	7.08 7.09 7.09 7.09 7.09 7.09 7.09 7.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0	8.47 8.47 10.57 10.67 10.67 10.57 10.57 1.59 2.45 0.11 57.79 1.359 2.655 0.11 57.79 1.359 2.655 2.075 2.655 2.055 2.655 2.655 1.556 0.464 0.464 0.465 1.555 5.631 1.541 2.059
Sample No 20, 110, 110, 110, 110, 110, 100, 100,	0.718 K:5-04 53.2 0.9773 221.3 8.25 0.259 2.26 0.247 99.79 1.807 4.505 - 2.002 2.887 4.698 0.719 0.247 9.002 2.887 4.698 0.736 0.736 0.736 0.736 0.736 0.736 0.736 0.736 0.736 0.736 0.736 0.736 0.736 0.736 0.736 0.736 0.736 0.736 0.736 0.737 1.807 1.875 1.877 1.877 1.877 1.877 1.877 1.877 1.877 1.877 1.985 1.877 1.877 1.877 1.995 1.877 1.995 1.877 1.995 1.877 1.995 1.995 1.995 1.995 1.995 1.995 1.995 1.995 1.995 1.995 1.995 1.995 1.995 1.995 1.995 1.995 1.975 1.075	0.594 8-01 55.95 0.75 17.69 6.24 2.971 5.425 0.121 2.971 5.425 0.285 95.81 0.285 95.81 0.775 2.779 - 0.581 0.575 5.997 2.975 1.985 4.825 4.825 0.752 5.997 2.977 0.751 1.985 4.825 2.439 0.752 5.997 2.977 0.752 5.997 2.977 0.752 5.997 2.977 0.752 5.997 2.977 0.752 5.997 2.977 0.752 5.997 2.977 0.752 5.997 2.977 0.752 5.997 2.977 0.752 5.997 2.977 0.752 5.997 2.975 1.985 4.835 5.997 1.985 4.975 5.977 5.997 1.985 4.975 5.9777 5.9777 5.977 5.977 5.977 5.9777 5.9777 5.9777 5.9777 5.9	0.713 KS-1 55.1 0.75 18 9.4 0.21 1.99 4.27 0.60 99.7 1.30 2.93 0.59 0.60 99.7 1.30 2.93 0.59 1.97 0.60 9.4 0.59 1.99 1.10 9.4 0.21 1.99	0.609 33 13 13 45 5 0.60 13 13 13 13 13 13 13 13 13 13 13 13 13	13.85 R-02 84 8-02 84 8-02 84 8 8-02 85 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	2.959 P-03 66.33 0.506 6.097 0.056 6.097 0.056 6.097 13.34 3.01 0.0331 1.34 3.01 0.0331 1.354 6.961 1.373 6.961 1.373 6.961 1.373 6.91 1.374 2.092 1.373 6.316 2.092 1.373 6.376 7.321 6.575 7.321 6.575 7.321 6.575 7.321 6.575 7.321 6.575 7.321 6.575 7.321 6.575 7.321 6.575 7.321 6.575 7.321 6.575 7.321 6.575 7.321 6.57 7.321 6.57 7.32 7.32 7.32 7.32 7.32 7.32 7.32 7.3	7.203 R-04 45.45 45.45 1.11 15.05 13.61 0.164 1.6 0.005 0.062 97.33 1.6 0.405 0.405 97.33 1.235 9.017 - 1.235 9.017 - 1.235 9.017 - 1.235 9.017 - 1.245 0.64	7.2 R-05 41,23 0.725 25,56 7.45 0.774 2,55 13,27 1,29 0.291 0.056 95,14 1,225 - - 1,291 0.056 95,14 1,225 - - - - - - - - - - - - -	72 R- 477 0.44 1.6 1.1 1.2 2.2 2.4 2.2 2.4 2.2 2.4 2.2 2.4 2.2 2.4 2.2 2.4 2.2 2.4 2.2 2.4 2.2 2.4 2.4	7.08 7.09 7.09 7.09 7.01 7.01 7.01 7.01 7.01 7.01 7.01 7.01	8.67 8.67 1.07 20.57 1.07 2.057 1.07 2.057 1.159 2.65 0.596 0.11 97.79 2.075 2.075 2.075 2.075 2.075 2.075 2.075 2.075 2.075 2.075 2.075 2.075 2.075 2.075 2.075 2.057 3.254 0.596 0.597 1.255 5.631 1.541 2.035 5.631 1.541 2.035 5.631 1.541 2.035 5.035 5.031 1.541 2.035 5.031 1.541 1.
Sample No 90: 110: 41:0: 110: 10: 10: 10: 10: 10: 10:	0.718 8(5-04 52.2 0.973 22.3 8.25 0.259 2.69 2.69 2.69 2.69 2.69 1.505 - - 3.002 3.0	0.594 8-01 55.95 0.75 17.69 6.54 0.121 5.625 4.034 1.297 - - 4.639 2.779 - - 4.639 5.755 5.957	0.713 KS-1 53.1 0.72 9.4 0.21 1.52 7.51 1.92 0.21 0.22 7.51 0.427	0.609	13.85 R-02 84 R-02 84 8-02 84 85 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	2.949 R-03 66.28 0.506 23.36 6.097 0.086 6.265 11.34 7.03 1.594 6.265 11.34 1.573 6.316 5.975 6.316 5.976 6.316 5.975 6.316 5.975 6.316 5.975 6.316 5.975 7.921 1.573 6.316 5.975 7.921 1.573 6.316 5.975 7.996 5.975 7.996 5.975 7.996 5.975 7.996 5.975 7.996 5.975 7.996 5.975 7.996 5.975 7.996 5.975 7.996 5.975 7.996 5.975 7.996 5.975 7.996 5.975 7.996 5.975	7.203 R-04 45.45 111 113.05 13.61 0.164 13.61 0.164 13.61 0.062 97.43 1.35 0.062 97.43 1.35 0.062 97.43 1.35 0.062 97.43 1.35 0.062 97.43 1.35 0.663 0.66 0.66	7.2 3 -45 45.25 0.725 25.56 7.45 0.725 3.55 13.27 1.75 0.1591 0.05 5 .14 1.645 2.765 6 .159 12.25 7 13.27 1.75 13.27 1.75 13.27 1.75 13.27 1.75 13.27 1.75 13.27 1.75 13.27 1.75 13.27 1.75 13.27 1.75 13.27 1.75 13.27 1.75 13.27 1.75 13.27 1.75 13.27 1.75 13.27 1.75 13.27 1.75 13.27 1.75 13.27 1.75 13.27 1.75 13.27 1.75 13.27 1.75 13.27 1.75 13.27 1.75 13.27 1.75 13.27 1.75 13.27 1.75 13.27 1.75 13.27 1.75 13.27 1.75 13.27 1.75 13.27 1.75 13.27 1.75 13.27 1.75 13.27 1.75 13.27 1.75 13.27 1.75 13.27 1.75 13.27 1.75 13.275 13.275 13.275 13.275 13.275 13.275 13.275 13.275 13.275 13.275 13.275 13.275 13.275 13.275 13.275 13.275 13.275 13.275 13.275 13.275 13.275 13.275 13.275 13.275 13.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.275 14.2	72 8.4 8.4 8.7 0.4 8.7 0.7 1.6 1.6 0.7 1.6 0.7 0.7 0.2 0.1 1.6 0.7 0.7 0.2 0.1 1.6 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7	7.08 7.09 7.09 7.09 7.01 7.01 7.01 7.01 7.01 7.01 7.01 7.02 7.02 7.02 7.02 7.02 7.02 7.02 7.02	8.67 8.67 10.67 20.57 10.67 20.57 1.27 6.297 1.29 2.65 0.11 57.79 1.259 6.237 0.695 2.075 2.655 2.075 3.256 0.695 2.055 2.055 3.256 0.466 0.4661 0.4661 0.4661 0.4661 1.256 5.631 1.256 5.633 1.256 5.633 1.256 5.633 1.256 5.633 1.256 5.633 1.256 5.635 1.1256 5.635 1.256 5.635 1.1256 5.635 1.256 5.635 5.635 1.256 5.635 1.256 5.635 5.
Sample No 20, 110, 110, 110, 110, 110, 100, 100,	0.718 K5-04 55.2 0.973 22.3 8.25 0.259 2.52 0.259 2.52 0.247 99.79 1.507 4.505 - 2.002 2.547 4.505 - 2.002 2.547 4.505 0.719 0.366 0.719 4.505 - 1.507 4.505 0.719 2.500 1.507 1.507 1.507 1.507 2.500 2.547 1.507 2.500 2.547 1.507 1.507 2.558 0.247 2.558 1.507 1.507 2.558 1.507 1.507 2.558 0.366 0.719 2.558 0.368 0.738 0.778 0.739 0.7577 0.7577 0.757 0.7577 0.	0.594 8-01 55.95 0.75 17.69 6.24 2.971 5.425 0.121 2.971 5.425 0.285 95.81 0.285 95.81 1.459 2.779 - - 6.537 5.957 2.972 0.751 1.985 4.556 2.439 0.752 5.957 2.957 1.985 4.556 2.439 - - 5.957 2.971 1.985 4.556 2.439 - - - - - - - - - - - - -	0.713 KS-1 55.1 0.75 16 9.4 0.21 1.99 1.99 0.60 99.7 1.99 0.60 99.7 1.99 0.60 99.7 1.99 0.60 99.7 1.99 0.60 9.4 1.99 0.55 1.95 0.55 1.95 0.55 1.95 0.55 1.95 0.55 1.95 0.55 1.95 0.55 1.95 0.55 1.95 0.55 1.95 0.55 1.95 1.95 0.55 1.95 1.95 0.55 1.95 1.95 0.55 1.9	0.609 3 3 4 5 5 6 0.5 5 5 6 7 5 6 7 5 6 7 5 7 5 6 7 5 7 5 6 7 5 7 5	13.85 R-02 84 8-02 84 8-02 84 8-02 85 8 96 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	2.959 P-03 66.33 0.506 6.097 0.056 6.097 0.056 6.097 13.34 3.01 0.0331 1.34 3.01 0.0331 1.34 6.961 1.374 6.961 1.373 6.316 6.31 6.31	7.203 R-04 45.45 1.11 15.05 13.61 0.164 1.61 0.164 0.005 0.005 97.23 1.6 0.405 97.23 1.235 9.017 - 1.235 9.01 - 1.235 9.017 - 1.235 9.01 - 1.235 9.01 - 1.23	7.2 R-05 41.215 0.715 25.56 7.45 0.774 2.55 7.45 0.774 2.55 7.45 13.27 1.27 0.291 0.06 95.165 1.645 1.645 1.645 1.645 1.511 2.6459 2.766	72 8- 477 0.4.4 477 0.4.4 1.6 1.1 1.6 1.1 1.7 1.1 1.6 1.1 1.6 1.1 1.7 1.1 1.6 1.1 1.7 1.1 1.6 1.1 1.7 1.1 1.6 1.1 1.7 1.1 1.6 1.1 1.7 1.1 1.6 1.1 1.7 1.1 1	7.08 7.09 7.09 7.09 7.09 7.01 7.01 7.01 7.01 7.01 7.01 7.01 7.01	8.67 8.67 1.07 20.57 1.07 2.057 1.07 2.057 1.159 2.65 0.596 0.11 97.79 2.075 2.057 3.0596 0.117 2.055 0.596 0.596 0.596 0.596 0.596 0.596 0.597 1.259 2.075 2.075 2.075 2.075 2.057 2.057 2.055 0.596 0.596 0.596 0.596 0.596 0.596 0.596 0.597 2.075 2.075 2.075 2.057 2
Sample No S0: 10	0.718 K:5-04 52.2 0.973 22.3 8.25 0.259 2.69 2.69 2.69 2.69 2.69 1.507 4.695 0.247 56.79 1.507 4.695 0.718 0.718 0.702 2.827 4.695 0.702 2.827 1.507 4.695 0.718 0.718 0.726 0.247 56.79 1.507 1.575 1.039 3.477 1.039 3.477 1.039 3.477 1.039 3.477 1.575 1.039 3.477 1.575 1.039 3.477 1.575 1.039 3.477 1.575 1.039 3.477 1.575 1.039 3.477 1.575 1.039 3.477 1.575 1.	0.594 8-01 55.92 0.75 17.69 6.54 0.121 2.971 5.625 4.025 4.025 2.33 0.235 95.81 1.699 2.779 - 4.639 5.957 5.9	0.713 KS-1 53.1 0.72 9.4 0.21 1.57 0.427 0.	0.609	13.85 R-02 84 R-02 84 8-02 84 85 85 85 85 85 85 85 85 85 85 85 85 85	2.949 R-03 66.38 6.097 0.086 6.265 13.36 6.097 0.086 6.265 13.34 1.573 6.310 0.087 R.36 6.961 1.573 6.316 6.961 1.573 6.316 5.976 7.321 6.732 1.696 7.321 6.732 1.696 7.321 6.735 7.321 6.735 7.321 6.735 7.321 6.735 7.321 6.735 7.321 6.735 7.321 7.996 7.321 7.996 8.99 7.321 7.996 8.99 7.32 7.996 8.99 7.32 7.996 8.99 7.32 7.996 8.99 7.32 7.996 8.99 7.32 7.996 8.99 7.32 7.996 8.99 7.32 7.996 8.99 7.32 7.996 8.99 7.32 7.996 8.99 7.32 7.996 8.99 7.32 7.99 8.9 7.32 7.99 8.9 7.32 7.9 7.32 7.9 7.32 7.32 7.32 7.32 7.32 7.32 7.32 7.32	7.205 R-04 45.45 11.01 11.05 13.61 0.164 13.61 0.164 1.0 14.6 0.065 0.065 0.065 0.065 0.065 1.25	7.2 R-05 45.25 0.7745 0.7745 0.7745 0.7745 0.7745 0.7745 0.7745 0.7745 0.7745 0.7745 0.7745 0.7745 0.7591 0.059 0.1591 0.059 0.1591 0.059 0.1595 0.159	72 84 87 87 87 87 87 87 87 87 87 87	7.08 7.09 7.09 7.09 7.09 7.09 7.01 7.09 7.01 7.09 7.01 7.09 7.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0 7.0	8.67 8.67 10.67 20.57 10.67 20.57 11.89 2.65 0.11 97.79 0.596 0.595 0.595 2.671 1.259 2.691 2.255 0.506 - - 0.695 2.651 1.256 0.506 - - 0.695 2.651 1.256 5.655 1.1256 5.655 1.1257 5.655 1.1257 5.655 1.1257 5.655 1.1257 5.655 1.256 5.655 1.256 5.655 1.256 5.655 1.256 5.655 5.756 5.756 5.756 5.7575 5.757 5.757 5.7
Sample No 20, 110, 12,0, 10, 10, 10, 10, 10, 10, 10, 10, 10,	0.718 8:5-04 52.2 0.973 22.3 8.25 0.259 2.25 2.25 0.247 2.25 0.247 99.79 1.507 4.505 - 2.002 2.367 0.247 99.79 1.507 4.505 0.247 99.79 1.507 4.505 0.247 99.79 1.507 4.505 0.784 0.784 0.719 4.032 1.575 10.39 2.471 - 10.95 599.6 27.63 27.74 0.75 10.95 599.6 27.74 0.75 10.95 599.6 27.75 10.95 599.6 27.75 10.95 599.6 27.75 599.6 27.75 599.6 27.75 599.6 27.75 599.6 27.75 599.6 27.75 599.6 27.75 599.6 27.75 599.6 27.75 599.6 27.75 599.6 27.75 599.6 27.75 599.6 27.75 599.6 27.75 599.6 27.75 599.75 505 505 505 505 505 505 505 5	0.594 8-01 55.95 0.75 17.69 6.24 2.971 5.425 0.121 2.971 5.425 0.121 2.971 5.425 0.121 2.971 5.425 0.121 2.971 5.425 0.125 5.975 5.975 1.985 0.751 5.975 5.975 1.985 0.751 5.975 5.975 1.985 0.751 5.975 1.985 0.751 5.975 1.985 0.751 5.975 1.985 0.751 5.975 1.985 1.975 1.985 1.975 1.985	0.713 KS-1 55.1 0.73 9.4 0.21 1.92 7.51 1.92 7.51 1.99 1.97 1.99 1.97 1.9	0.609 33 34 45 5 0.60 5 6 0.5 5 6 7 1 2 0.6 5 5 0.5 5 7 1 2 0.6 5 5 0.5 5 1 0 6 7 5 1 0 6 7 5 1 0 6 7 5 1 0 6 7 5 1 0 7 5 1 1 0 7 5 1 1 0 7 5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	13.83 R-02 84 8-02 84 8-02 84 8 95 8 95 8 95 8 95 8 95 8 9 95 8 9 95 9 9 9 9	2.939 R-03 65.25 0.506 25.26 6.097 0.056 6.097 0.056 6.097 1.32 1.32 1.32 1.32 1.32 1.32 1.32 1.32	7.203 R-04 45.45 1.11 15.05 13.61 0.164 1.6 0.065 0.062 97.33 1.6 0.405 0.062 97.33 1.235 9.017 - 1.235 9.017 - 2.199 2.625 2.059 2.625 0.621 0.645 2.059 2.625 1.626 0.655 2.059 2.531 7.57 15.33 19.246	1.2 B-05 d1,23 0.725 25,56 7.45 2,55 13,27 1,29 0.291 0.292 0.292 0.295 0.292 0.292 0.292 0.292	72 R - 477 0.4.4 16 E 1 2.1 2.1 2.2 2.2 2.2 2.2 2.2 2.2 2.2 2.	7.08 7.09 7.09 7.09 7.01 7.01 7.01 7.01 7.01 7.01 7.01 7.01	8.67 8.67 1.07 20.57 10.67 20.57 10.67 20.57 1.257 2.65 0.596 0.117 2.65 0.596 0.117 2.65 0.596 0.127 2.65 0.596 0.596 0.127 2.65 0.596 0.597 0.596 0.597 1.559 0.565 0.555 0.5
Sample No SOL TIO: JJOI TIO: JJOI TRO: JOI TRO: JOI TRO: JOI TRO: JOI TRO: JOI TRO: JOI TRO: JOI TRO: JOI TRO: JOI TRO: JOI TRO: JOI TRO: JOI TRO: JOI TRO: JOI TRO: JOI TRO: JOI TRO:	0.718 K:5-04 52.2 0.9773 22.3 8.25 0.259 2.69 2.69 2.69 2.69 2.69 1.507 4.695 0.247 56.79 1.507 4.695 0.719 0.719 0.702 2.827 4.695 0.719 0.719 1.507 4.695 0.719 1.507 1.575 1.022 1.575 1.039 3.477 3.4777 3.4777 3.4777 3.4777 3.47777 3.4777777777777777777777777777777777777	0.594 8-01 55.92 0.75 17.69 6.54 0.121 2.971 5.625 4.026 4.026 2.33 0.235 95.81 1.699 2.779 - 4.639 5.957 5.957 3.992 0.75 5.957 1.935 5.957 1.935 5.957 1.935 5.957 1.935 5.957 1.935 1.935 5.957 1.935 1.93	0.713 KS-1 5.1 9.4 9.5	0.609	13.85 R-02 84 R-02 84 8-02 84 85 10 13 8 8 10 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	2.949 R-03 66.38 6.097 0.086 6.265 13.36 6.097 0.086 6.265 13.34 1.34 1.534 6.961 1.573 6.316 6.961 1.573 6.316 5.976 7.321 6.316 5.976 7.321 6.735 1.092 1.975 7.321 6.735 7.321 6.735 7.321 6.735 7.321 6.735 7.321 6.735 7.321 7.42 7.996 8.99 7.321 7.996 8.99 7.32 7.996 8.99 7.32 7.996 8.99 7.32 7.996 8.99 7.32 7.996 8.99 7.32 7.996 8.99 7.32 7.996 8.99 7.32 7.996 8.99 7.32 7.99 8.9 7.32 7.99 8.9 7.32 7.99 8.9 7.32 7.99 8.9 7.32 7.9 7.32 7.9 7.32 7.32 7.32 7.32 7.32 7.32 7.32 7.32	7.205 R-04 45.45 11.01 11.05 13.61 0.164 13.61 0.164 1.0 1.6 0.065 0.065 0.065 1.255	7.2 R-05 41,21 0.773 25,56 7.45 0.7745 0.785 13,27 1.79 0.0591 0.0591 0.059 96,14 1.665 12,225 - 1.591 2.766 - 0.2995 0	72 84 84 87 84 84 84 84 84 84 84 84 84 84	7.08 7.09 7.09 7.09 7.09 7.01 7.01 7.01 7.01 7.01 7.01 7.01 7.02 7.02 7.02 7.02 7.02 7.02 7.02 7.02	8.67 8.67 10.67 20.57 10.67 20.57 11.89 2.65 0.11 97.79 0.596 0.595 2.075 2.075 2.691 2.259 0.595 2.075 2.075 2.075 2.075 2.075 2.075 2.075 2.075 2.075 2.075 2.075 2.075 2.075 2.075 2.075 2.075 2.055 2.075 2.075 2.075 2.075 2.075 2.075 2.075 2.075 2.055 2.075 2.075 2.075 2.055 2.075 2.055 2.075 2.055 2.075 2.055 2.075 2.055 2.075 2.055 2.075 2.055 2.075 2.055 2.075 2.055 2.055 2.075 2.055 2.075 2.055 2.075 2.055 2.075 2.055 2.075 2.075 2.055 2.075 2.055 2.075 2.055 2.075 2.055 2.075 2.055 2.075 2.055 2.075 2.055 2.075 2.055 2.075 2.055 2.075 2.055 2.075 2.055 2.075 2.055 2.075 2.055 2.075 2.055 2.075 2.055 2.075 2.055 2.075 2.055 2.555
Sampia No 20: 110: 120: 110: 120: 100: 100: 100:	0.718 K5-04 52.2 0.973 22.3 8.25 0.259 2.82 2.82 7.39 2.49 2.49 2.26 0.247 99.79 1.807 4.505 - - 3.002 2.827 4.695 0.905 0.36 0.719 4.032 1.575 10.39 3.471 - 1.575 3.471 - 1.575 -	0.594 8-01 55.95 0.75 17.69 6.24 2.971 5.425 0.121 2.971 5.425 0.121 2.971 5.425 0.121 2.971 5.425 0.121 2.971 5.425 0.121 2.971 5.425 0.125 5.975 1.769 5.752 5.975 1.985 1.639 5.975 1.985 1.639 1.035	0.713 KS-1 53.1 0.73 9.4 0.73 9.4 0.21 1.93 7.51 1.93 9.4 9.7 1.93 9.4 9.7 1.93 9.4 9.7 1.93 9.4 9.7 1.93 9.4 9.7 1.93 9.4 9.7 1.93 9.4 9.7 1.93 9.4 9.7 1.93 9.4 9.7 1.93 9.4 9.7 1.93 9.4 9.4 9.5 1.93 9.4 9.5 1.93 9.4 9.5 1.93 9.4 9.5 1.93 9.4 9.5 1.93 9.5 1.93 9.5 1.93 9.5 1.93 9.5 1.93 9.5 1.93 9.5 1.93 9.5 1.93 9.5 1.93 9.5 1.93 9.5 1.93 9.5 1.93 9.5 1.93 9.5 1.93 9.5 1.93 9.5 1.93 9.5 1.93 9.5 1.93 9.5 1.93 9.5 1.95 1.95 9.5 1.95	0.609 3 1 4 5 5 0.	13.85 R-02 84 8-02 84 8-02 84 85 8 13 13 14 15 15 15 15 15 15 15 15 15 15 15 15 15	2.949 R-03 66.28 0.506 23.16 6.097 0.056 8.097 1.324 1.324 1.324 1.324 1.533 6.316 6.961 1.573 6.316 6.96 6.961 1.573 6.316 6.975 7.321 6.705 6.316 6.975 7.321 6.705 6.316 6.975 7.321 6.705 6.316 6.975 7.321 7.321 7.321 7.321 7.322 7.321 7.322 7.32 7.3	7.203 R-04 45.45 1.11 15.05 13.61 0.164 0.164 0.165 0.062 97.33 1.6 0.405 97.33 97.33 1.2 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3	1.21 R-05 43,23 0.725 25,56 7.45 25,56 7.45 25,56 7.45 25,56 7.45 2.55 0.291 0.291 0.291 0.291 0.291 0.291 0.291 0.291 0.291 0.291 0.291 0.292 0.292 0.293 0.295 0.295 0.295 0.295 0.295 0.295 0.295 0.295 0.295 0.295 0.997.4 14.81 12.99 0.995 0.995	72 8- 477 0.4 477 0	7.08 7.09 7.09 7.01 7.01 7.01 7.01 7.01 7.01 7.01 7.01	8.67 8.67 1.07 20.57 10.67 20.57 10.67 20.57 1.259 6.297 1.259 6.237 0.698 0.117 8.297 1.259 6.237 0.698 0.597 0.598 0.597
Sample No 201 110; 44,01 110; 44,01 100; 14,00 14,000 14,	0.718 K:5-04 52.2 0.9773 22.3 8.25 0.259 2.69 2.69 2.69 2.69 2.69 1.807 4.905 0.247 59.79 1.807 4.505 - 3.002 2.827 4.695 0.719 0.719 1.807 4.505 - 3.002 2.827 4.695 0.719 2.607 3.002 2.827 4.695 0.719 2.607 3.002 2.827 4.695 0.719 3.002 2.827 3.002 2.827 3.002 2.827 3.002 2.827 3.002 2.827 3.002 2.827 3.002 2.827 3.002 2.827 3.002 2.827 3.002 2.827 3.002 2.827 3.002 3.827 4.695 0.719 3.002 3.827 4.695 0.719 3.002 3.827 4.695 0.724 0.719 3.002 3.827 4.695 3.002 3.827 4.695 3.739 3.002 3.827 4.695 3.739 3.002 3.827 4.695 3.739 3.002 3.827 4.695 3.739 3.002 3.827 4.695 3.757 1.039 3.757 10.399 3.757 10.399 3.775 10.399 3.775 10.399 3.775 10.399 3.775 10.399 3.775 10.399 3.775 10.399 3.775 10.399 3.775 10.399 3.775 10.399 3.775 10.399 3.775 10.399 3.775 10.399 3.775 10.399 3.775 10.397 3.757 10.397 3.757 10.397 3.757 10.397 3.757 10.397 3.757 10.397 3.757 10.397 3.757 10.397 3.757 10.397 3.7577 3.7577 3.7577 3.75777 3.7577777777777777777777777777777777777	0.594 8.401 55.92 0.75 17.49 6.54 0.121 5.425 4.054 2.33 0.235 94.81 1.499 2.779 - 4.459 5.987 - 5.987 - 5.992 0.75 1.995 1.295 1.995 1.295 1.995 1.295 1.295 1.995 1.295 1.995 1.29	0.713 KS-1 53.1 0.72 9.6 0.21 1.92 1.92 0.59 0	0.609	17.85 R-02 84 R-02 84 8-02 84 85 85 85 85 85 85 85 85 85 85 85 85 85	2.949 R-03 66.38 0.506 13.36 6.097 0.086 6.097 0.086 6.265 11.34 3.01 0.037 R.36 6.310 0.037 R.36 6.363 1.584 6.363 1.584 6.363 1.573 6.316 5.976 6.316 5.976 6.316 5.976 6.316 5.975 6.316 5.975 6.316 5.975 6.316 5.975 6.316 5.975 6.316 5.975 6.316 5.975 6.316 5.975 6.316 5.975 6.316 5.975 6.316 5.975 6.316 5.975 6.316 5.975 6.316 5.975 6.316 5.975 6.316 5.975 6.31 5.975 6.31 5.975 6.31 5.975 6.31 5.975 6.31 5.97 6.31 5.97 6.31 6.37 5.96	7.203 R-04 45.45 111 11.05 13.61 0.144 13.61 0.144 13.61 0.405 0.4	7.2 3 -45 41,23 0.773 25,56 7.45 25,56 7.45 25,56 7.45 2,55 13,27 1,29 0.291 0.056 96,16 2,55 12,25 - - - - - - - - - - - - -	72 8.4 8.4 8.4 8.4 8.4 8.4 9.4 9.4 9.4 9.4 9.4 9.4 9.4 9	7.08 7.09 7.09 7.09 7.01 7.01 7.01 7.01 7.01 7.01 7.01 7.01	8.67 8.67 10.67 20.57 10.67 20.57 11.89 2.65 0.11 97.79 0.596 0.596 0.11 97.79 1.259 1.259 1.259 1.259 1.259 1.259 1.259 1.259 1.259 1.259 1.255 1.671 2.651 1.259 1.259 1.255 1.651 1.256
Sampia No 20: 110: 110: 110: 110: 110: 100: 100:	0.718 8:5-04 52.2 0.973 22.3 8.25 0.259 2.82 7.39 2.49 2.49 2.26 0.347 59.79 1.807 4.505 - - 2.827 4.69 0.347 59.79 1.807 4.605 0.347 0.719 4.635 0.366 0.719 4.635 0.366 0.719 4.635 0.366 0.719 4.635 0.366 0.719 4.635 0.366 0.756 0.366 0.757 10.39 3.471 10.39 3.471 10.39 3.471 10.39 3.471 0.365 0.756 0.765 0.775 0.765 0.75	0.594 8-01 55.95 0.75 17.69 6.24 2.971 5.425 0.121 2.971 5.425 0.121 2.971 5.425 0.121 2.971 5.425 0.121 2.971 5.425 0.121 0.121 0.121 0.125 5.975 1.985 1.0.985 1.975 1.985 1.985 1.975 1.985 1.975 1.985 1.975 1.985 1.975 1.985 1.975 1.985 1.975 1.985 1.975 1.985 1.975 1.985 1.975 1.975 1.985 1.975 1.985 1.975 1.985 1.975 1.985 1.975 1.975 1.975 1.985 1.975 1.9	0.713 KS-1 53.1 0.73 9.4 0.21 1.97 0.60 9.7 1.97 0.60 9.7 1.97 0.60 9.7 1.97 0.60 9.7 1.97 0.60 9.7 1.97 0.60 9.7 1.97 0.60 9.7 1.97 0.60 9.7 1.97 0.60 9.7 1.97 0.60 9.7 1.97 0.60 9.7 1.97 0.60 9.7 1.97 0.60 9.7 1.97 0.60 9.7 1.97 0.60 9.7 1.97 0.60 9.7 1.97 0.60 9.7 1.97 1.97 0.60 9.7 1.97 1	0.609 3 1 4 5 5 0.5 5 0.5 5 0.5 5 7 1. 2 0.6 5 95 5 2.7 5 5 5 2.7 5 5 5 2.7 5 3 6 5 2.7 5 3 7 1. 1 0. 5 3.6 7 3. 1 0. 5 3.6 7 5. 5 3.	13.85 R-02 84 8-02 84 8-02 84 85 8-02 85 84 85 85 85 85 85 85 85 85 85 85 85 85 85	2.949 R-03 66.28 0.506 23.36 6.097 0.056 8.097 0.056 8.097 1.3.4 1.3.4 1.3.4 1.3.4 1.3.4 1.5.3 1.5.3 6.3.16 6.961 1.573 6.316 6.961 1.573 6.316 6.961 1.573 6.316 6.961 1.573 6.316 6.973 6.316 6.961 1.573 6.31 6.096 1.573 6.31 6.012 6.573 6.012 6.023 0.23 0.2	7.203 R-04 45.45 1.11 15.05 13.61 0.164 0.165 0.062 97.33 1.6 0.405 97.33 97.33 1.2 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3	1.21 R-05 45.23 0.725 25.56 7.45 25.56 7.45 2.55 0.291 0.291 0.291 0.291 0.291 0.291 0.291 0.291 0.291 0.291 0.291 0.291 0.291 0.291 0.292 0.292 0.293 0.295 0.295 0.295 0.295 0.295 0.295 0.295 0.295 0.295 0.295 0.2952 0.2952 0.2952 0.2952	72 8- 677 0.6.4 16 15 17 16 18 1 1.1 1.2 1.2 1.2 1.2 1.2 1.2 1.	7.08 7.09 7.09 7.01 7.01 7.01 7.01 7.01 7.01 7.01 7.01	8.67 8.67 1.07 20.57 1.07 2.65 0.596 0.117 6.297 1.259 6.237 0.696 0.596 0.596 0.596 0.596 0.596 0.596 0.596 0.596 0.596 0.596 0.596 0.596 0.596 0.595
Sample No 201 110; 41;01 Fr;02 Ma0 Mg0 C10 N3;0 F;02 F;02 F;03 ACNK 40 F;03 F;04 ACNK 40 F;04 F;04 ACNK 40 F;04 F;05 F;05 F;05 F;05 F;05 F;05 F;05 F;05	0.718 K:5-04 52.2 0.9773 22.3 8.25 0.259 2.69 2.69 2.69 2.69 2.69 1.807 4.505 - 3.002 2.827 4.505 - 3.002 2.827 4.505 - 3.002 2.827 4.505 - 3.002 2.827 1.807 4.505 - 3.002 2.827 1.807 3.002 2.827 3.827 3.827 1.807 3.925 1.807 3.002 2.827 3.92 3.9277 3.9277 3.9277 3.9277 3.9277 3.92777 3.92777777777777777777777777777777777777	0.594 8.401 55.92 0.75 17.49 6.54 0.151 2.971 5.425 4.034 2.33 0.235 94.51 1.499 2.779 - 4.453 9.51 1.499 2.779 -	0.713 KS-1 53.1 0.72 9.6 0.21 1.92 1.92 0.21 1.92 0.21 1.92 0.21 1.92 0.21 1.92 0.21 1.92 0.21 1.92 0.21 1.92 0.21 1.92 0.21 1.92 0.21 1.92 0.22 0.22 0.25 0.05 0.25	0.609 3 3 4 5 6 5 6 6 7 1 6 7 1 7	17.83 R-02 84 R-02 84 R-02 84 R-02 84 R-02 84 R-02 84 84 84 84 84 84 84 84 84 84 84 84 84	1.949 2.949 80.03 66.33 6.097 0.086 6.097 0.086 6.097 0.086 6.097 0.086 6.097 0.086 6.097 0.086 6.097 0.086 6.263 1.1.74 0.031 0.037 0.331 0.037 7.3.4 8.961 1.572 6.316 5.976 7.321 6.732 6.973 8.573 8.099 17.12 7.996 17.12 17.32 0.6401 2.341 0.641 0.641 0.233 0.233	7.105 R-04 45.45 111 115.05 13.61 0.164 13.61 0.164 1.6 0.005 0.005 97.35 1.6 0.005 97.35 1.6 0.005 97.35 1.6 0.005 0.605 97.35 1.6 0.605	7.2 R-05 41, 21 0.773 25, 56 7, 45 2, 55 13, 27 1, 27 0, 291 0, 05 95, 14 1, 645 12, 23 - 1, 51 2, 645 12, 23 - 1, 51 2, 645 12, 23 - 0, 125 - 0, 155 - 0, 125 - 0, 125	72 8.4 8.4 8.7 8.4 8.7 8.4 9.7 9.4 9.4 9.4 9.4 9.4 9.4 9.4 9.4	7.08 7.09 7.09 7.01 7.01 7.01 7.01 7.01 7.01 7.01 7.01	8.47 8.47 1.07 20.57 1.07 2.057 1.189 2.459 0.596 0.11 97.79 6.227 1.259 6.237 0.596 0.596 0.596 0.596 0.595 2.075 2.075 2.057 2.057 0.595 0.595 0.595 0.595 0.595 1.256 0.557 1.256 5.651 1.256 5.551 1.256 5.551 1.256 5.551 1.256 5.551 1.256 5.551 1.256 5.551 1.256 5.551 1.256 5.551 1.256 5.551 1.256 5.551 1.256 5.551 1.256 5.551 1.256 5.551 1.256 5.551 1.256 5.552 1.256 5.555 1.256 5.555 1.256 5.555 1.256 5.555 1.256 5.555 1.256 5.555 1.256 5.555 1.256 5.555 5.555 5.555 5.555 5.555 5.555 5.555 5.555
Sample No Son Pierror Sin State Son State Stat	0.718 8(5-04 52.2 0.973 22.3 8.25 0.259 2.82 7.29 2.69 2.79 2.69 2.69 2.79 2.69 2.69 2.69 2.69 2.79 2.69 2.69 2.79 2.69 2.79 2.69 2.79 2.69 2.79 2.69 2.79 2.69 2.79 2.69 2.79 2.69 2.79 2.69 2.79 2.69 2.79 2.69 2.79 2.69 2.79 2.69 2.79 2.69 2.79 2.69 2.79 2.69 2.75 2.69 2.75 2.69 2.75 2.69 2.75 2.69 2.75 2.69 2.69 2.75 2.69 2.69 2.75 2.69 2.69 2.69 2.69 2.69 2.69 2.75 2.69 2.76 2.76 2.76 2.76 2.76 2.76 2.76 2.76 2.76 2.76 2.76 2.76 2.76 2.76 2.69 2.76 2.76 2.76 2.76 2.75 2	0.594 8-01 55.95 0.75 17.69 6.24 2.971 2.779 2.779 2.779 2.975 2.025 2.025 2.025 2.025 2.025 2.025 2.025 2.025 2.025 2.025 2.025 2.057 2.0572 0.512 2.0572 0.512 2.557 0.012 0.0	0.713 KS-1 53.1 0.72 9.4 0.21 1.57 0.60 58.7 1.57 0.60 58.7 1.57 0.65 0.65 0.65 0.65 0.57 1.57 1.57 1.57 0.65 0.65 0.57 1.57 1.57 0.65 0.55 1.57 1.57 0.65 0.55 1.57 1.57 0.65 0.55 1.57 1.57 0.65 0.55 1.57	0.609 3 13 4 5 6 5 0.5 5 0	13.83 R-02 84 R-02 84 85 8 13 13 13 14 15 15 15 15 15 15 15 15 15 15 15 15 15	2.959 R-03 66.25 0.506 23.36 6.097 0.056 6.097 0.056 6.263 11.34 7.36 1.573 6.263 1.573 6.316 6.961 1.573 6.316 6.961 1.573 6.316 6.961 1.573 6.316 6.961 1.573 6.316 6.961 1.573 6.316 6.961 1.573 6.316 6.961 1.573 6.316 6.96 1.573 6.316 6.96 1.573 6.316 6.973 6.316 6.973 6.316 6.973 6.316 6.973 6.316 6.973 6.316 6.973 6.316 6.973 6.316 6.973 6.316 6.973 6.31 6.373 6.32 6.32 6.32 6.32 6.32 6.32 6.32 6.3	7.105 7.105 7.105 7.105 7.105 7.105 7.105 7.11 7.11 7.11 7.11 7.11 7.11 7.11 7.1	7.2 3.45 3.45 3.45 3.45 3.45 3.45 3.45 3.45 3.45 3.45 3.45 3.45 3.45 3.45 3.45 3.4645 1.2.28 3.4645 1.2.28 3.4645 1.2.29 3.4645 1.2.29 3.4645 1.351 3.4645 1.6445 1.6445 1.6445 1.6445 1.6445 1.6455 1.6455 3.451 3.4645 3.451 3.4645 3.451 3.4645 3.451 3.4645 3.451 3.4645 3.451 3.4645 3.451 3.4645 3.451 3.4645 3.451 3.4645 3.451 3.4645 3.451 3.4645 3.451 3.4645 3.451 3.4645 3.451 3.4645 3.451 3.4645 3.451 3.4645 3.451 3.4645 3.451 3.4645 3.451 3.4645 3.451 3.4645 3.451 3.4645 3.451 3.4645 3.451 3.4645 3.451 3.4645 3.451 3.4645 3.451 3.4645 3.451 3.4645 3.451 3.4645 3.451 3.4655 3.5115 4.5155 3.5115 4.5155 3.5115 4.5155 3.5115 3.6165 3.592 3.757 , 7 3.757 , 7	72 8- 47. 0.4 47. 0	7.08 7.09 7.09 7.01 7.01 7.01 7.01 7.01 7.01 7.01 7.01	8.67 8.67 1.07 20.57 1.07 2.65 0.596 0.117 6.297 1.159 6.237 0.695 6.237 0.695 6.237 0.695 1.259 6.237 0.695 1.259 1.259 6.237 0.695 1.259
Sample No 20, 110, 110, 110, 110, 110, 100, 100,	0.718 X 5-04 52.2 0.9773 22.3 5.25 0.259 2.69 2.69 2.69 0.247 592.79 1.807 4.505 - 3.002 2.69 1.807 4.505 - 3.002 2.827 4.505 - 3.002 2.827 4.505 - 3.002 2.827 4.505 - 3.002 2.827 1.807 1.807 3.002 2.827 1.807 3.002 2.827 3.002 2.827 3.002 2.827 3.002 2.827 3.002 3	0.594 8.01 55.92 0.75 17.69 6.54 0.121 2.971 5.625 4.034 4.034 2.233 0.235 95.81 1.699 2.779 - - 4.639 2.779 - - 5.987 3.987 1.985 4.856 2.439 - - - - - - - - - - - - -	0.713 KS-1 53.1 0.73 9.4 0.21 1.93 1.93 1.93 0.21 1.93 0.21 1.93 0.21 1.93 0.21 1.93 0.21 1.93 0.22 1.93 0.23 1.93 0.23 1.93 0.25 1.93 0.25 1.95 0.25 1.95 0.25	0.609 3 0.609 3 0.609 3 0.609 3 0.609 3 0.60 3 0.6 3 0.6 3 0.6 5 0.6	17.83 R-02 84 R-02 84 84 85 85 85 85 85 85 85 85 85 85 85 85 85	1.999 2.999 R-03 66.38 0.906 2.3.36 6.097 0.086 6.097 0.086 8.097 0.086 3.01 0.031 0.037 7.3.4 8.961 1.572 6.371 5.976 7.321 4.705 0.966 2.092 1.873 6.573 2.092 1.874 6.573 1.7.996 17.12 17.659 0.641 12.33 17.4.6	7.205 R-04 45.45 111 15.05 13.61 0.164 13.61 0.164 1.6 0.005 0.005 97.32 1.6 0.005 97.32 1.6 0.005 97.32 1.6 0.005 2.199 2.199 2.199 2.199 2.199 2.199 2.199 2.199 2.521 1.426 0.685 2.521 1.5.33 15.34 0.605 2.551 15.33 15.34 0.605 2.551 15.33 15.34 0.605 2.551 15.33 15.34 0.605 2.551 15.33 15.34 0.605 2.551 15.33 15.34 0.605 2.551 15.33 15.34 0.605 2.551 15.33 15.34 0.605 2.551 15.33 15.34 0.605 2.551 15.33 15.34 0.605 2.551 15.33 15.34 0.605 2.551 15.33 15.34 0.605 2.551 15.34 0.605 2.551 15.34 0.605 2.551 15.34 0.605 2.551 15.34 0.605 2.551 15.34 0.605 2.551 15.34 0.605 2.55 15.35 0.605 2.55 15.35 0.605 2.55 15.35 0.605 2.55 15.35 0.605 2.55 15.3 0.605 2.55 15.35	7.2 3.465 41.215 0.7735 25.56 7.45 0.773 2.5.76 7.45 0.771 1.75 1.527 1.217 1.751 0.054 96.16 95.16 1.6645 1.6645 1.6645 1.6645 1.6645 1.6645 1.6645 1.6645 1.6645 1.6645 1.6645 1.6645 1.6645 1.6645 1.6645 1.6645 1.6645 1.6645 1.6645 1.6645 1.6645 1.6645 1.6645 1.6645 1.6645 1.6645 1.6645 1.6645 1.6645 1.6645 1.6645 1.6645 1.6645 1.6645 1.6645 1.6645 1.6645 1.6645 1.6645 1.6655 1.6655 1.6655 1.6655 1.6655 1.6655 1.6655 1.6655 1.6655 1.6655 1.6655 1.6655 1.6655 1.6655 1.6655 1.6655 1.6655 1.6655 1.6655 1.6655 1.6655 1.6655 1.6655 1.6655 1.6655 1.6655 1.6655 1.6655 1.6655 1.6655 1.6655 1.6655 1.6655 1.6655 1.6655 1.6655 1.6655 1.6655 1.6655 1.6655 1.6655 1.6655 1.6655 1.6655 1.6655 1.6655 1.6655 1.6655 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555 1.6555	72 8 8 6 7 7 8 6 7 7 7 8 6 7 7 7 7 7 7 7 7 7 7 7 7 7	7.08 7.09 7.09 7.01 7.01 7.01 7.01 7.01 7.01 7.01 7.01	8.67 8.67 10.67 20.57 10.67 20.57 11.67 2.65 2.67 1.85 2.65 0.596 0.596 0.596 0.596 0.596 0.596 0.596 0.596 0.596 0.596 0.596 0.596 0.596 0.596 0.595 1.259 0.595 2.651 2.651 2.651 2.651 2.651 2.651 2.651 2.651 2.651 2.651 2.651 2.651 2.655 0.555 0
Sample No Son Plan No Sin Plan No Sin Plan No Sin Plan No Sin Sin Co Sin Sin Co Sin Sin Co Sin Sin Co Sin Sin Co Sin Sin Co Sin Sin Co Sin Sin Co Sin Sin Co Sin Sin Co Si Si Co Si Si Si Si Si Si Si Si Si Si Si Si Si	0.718 8(5-04 52.2 0.973 22.3 8.25 0.259 2.69 2.69 2.69 2.69 2.69 2.69 2.69 1.505 - - 3.002 2.655 0.247 85.79 1.505 - - 3.002 2.655 0.247 85.79 1.505 - - 3.002 2.655 0.247 3.002 3.655 0.715 2.655 0.247 3.002 3.655 0.715 3.002 3.655 0.715 3.002 3.655 0.715 3.002 3.655 0.715 3.002 3.655 0.715 3.002 3.655 0.715 3.002 3.655 0.715 3.002 3.655 0.715 3.002 3.655 0.715 3.002 3.655 0.715 3.002 3.655 0.715 3.002 3.655 0.715 3.002 3.655 0.715 3.002 3.655 0.715 3.002 3.655 0.715 3.002 3.655 0.715 3.002 3.655 0.715 3.002 3.655 0.715 0.755 0.756 0.756 0.755 0.756 0.757 3.002 3.655 0.756 0.757 0.756 0.757 0.757 0.756 0.757 0.757 0.756 0.757	0.594 8-01 55.95 0.75 17.69 6.54 0.121 5.625 4.014 1.595 2.571 7.79 - 4.639 2.779 - 4.639 5.755 5.957 7.995 2.997 1.985 4.054 1.595 2.595 - 5.957 1.769 2.595 1.595 2.595 2.595 - 5.957 2.595 2	0.713 KS-1 53.1 0.72 9.4 0.21 1.57 1.57 0.60 59.7 1.57 0.60 59.7 1.57 0.60 59.7 1.57 0.60 59.7 1.57 0.60 5.53 0.57 1.57 0.60 5.53 0.57 0.60 5.53 0.57 0.60 5.53 0.57 0.60 5.53 0.57 0.60 5.53 0.57 0.60 5.53 0.57 0.60 5.53 0.57 0.60 5.53 0.57 0.60 5.53 0.57 0.60 5.53 0.57 0.60 5.53 0.57 0.60 5.53 0.57 0.60 5.53 0.57 0.60 5.53 0.57 1.57 0.60 5.53 5.55 1.57 0.65 5.55	0.609 3 13 4 45 5 0.9 5 0.	13.83 13.83 R-02 14 56 13.1 14 56 13.1 14 151 152 153 154 155 151 152 153 154 157 158 157 154 157 1524 157	2.949 8-03 65.25 0.506 23.36 6.097 0.086 6.263 11.324 1.324 1.324 1.324 1.573 6.263 1.574 6.705 6.316 6.961 1.575 6.316 6.961 1.575 6.316 6.961 1.575 6.316 6.961 1.575 6.316 6.975 6.316 6.975 6.316 6.975 6.316 6.975 6.316 6.975 6.316 6.975 6.316 6.775 6.316 6.775 6.316 6.775 6.316 6.775 6.316 6.775 6.316 6.775 6.316 6.775 6.326 0.965 7.996 6.375 6.025 7.996 6.375 7.69 6.323 7.6 0.641 1.33 0.055 10.55	7.203 R-04 45.45 111 11.03 13.61 0.164 13.61 0.164 0.165 0.062 97.43 1.355 0.062 97.43 1.355 0.062 97.43 1.355 0.601 0.405 0.539 0.539 0.539 0.539 0.539 0.539 0.539 0.539 0.539 0.531 7.57 925.1 15.33 19.34 0.545 0.66	7.2' 3 -45 41,24 0.7745 0.745 0.745 0.745 0.751 2.555 13.27 1.75 0.251 0.05 5 ,51 1.225 - 1.51 2.645 2.765 0.255	72 84 847 647 168 847 168 847 168 847 168 847 168 847 168 847 168 848 168 168 168 168 168 168 168 16	7.08 7.09 7.09 7.09 7.01 7.01 7.01 7.02 7.02 7.02 7.02 7.02 7.02 7.02 7.02	8.67 8.67 10.67 10.67 10.67 10.67 10.67 1.89 2.65 0.11 57.79 1.259 6.237 0.695 2.075 2.655 2.075 2.695 2.055 2.075 2.695 2.055
Sample No 20, 110, 110, 110, 110, 110, 100, 100,	0.718 K:5-04 53.2 0.9773 22.3 8.25 0.259 2.69 2.69 2.69 2.69 1.807 4.505 - 3.002 3.827 4.505 - 3.002 3.827 4.505 0.719 0.719 0.247 99.79 1.807 4.505 - 3.002 3.837 4.505 0.716 0.507 31.412 0.507 31.422 0.705 0.507 31.422 0.705 0.507 31.422 0.718 0.507 31.422 0.718 0.507 31.422 0.718 0.507 32.18 0.507 55 55 55 55 55 55 55 55 55 55 55 55 55	0.594 8.401 55.95 0.75 17.69 6.54 2.971 5.425 0.121 1.497 2.971 5.425 4.034 2.233 0.285 95.81 1.499 2.779 5.987 3.985 4.634 4.634 0.721 5.987 3.985 4.635 4.735 4.755	0.713 KS-1 53.1 0.73 9.4 0.21 1.93 1.93 1.93 0.21 1.93 0.21 1.93 0.21 1.93 0.21 1.93 0.21 1.93 0.22 1.93 0.23 1.93 0.23 1.93 0.23 1.93 0.23 1.93 0.25 1.95 0.55 0.65 0.65 0.65 0.65 0.65 0.65 0.65 0.65 0.65 0.65 0.65 1.97 1.97 0.65 0.55 0.65 0.55 0.65 0.55 0.65 0.55	0.609 3 (1) 4 (5) 5 (1) 5 (2) 5	13.83 R-02 84 R-02 84 R-02 84 R-02 84 R-02 84 84 84 84 84 84 84 84 84 84 84 84 84	1.959 R-03 66.38 0.906 8.097 0.086 6.097 0.086 6.097 0.086 6.097 0.086 6.097 0.086 6.097 0.086 6.097 0.086 1.371 8.961 1.573 6.316 5.9716 5.9716 7.321 6.7321 6.7321 6.7321 6.7321 6.975 7.996 17.996 199.5 17.12 17.46 0.0355 0.0359 103.59	7.203 7.203 7.203 7.203 7.203 7.203 7.203 7.201 7.201 7.201 7.201 7.201 7.201 7.201 7.20 7.21 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	7.2 3 -45 3 -45 3 -55 3 -55 	72 8 8 47 67 16 8 16 8 1 16 8 1 16 16 16 16 16 16 16 16 16	7.08 7.09 7.09 7.09 7.01 7.01 7.01 7.01 7.01 7.01 7.01 7.02 7.02 7.02 7.02 7.02 7.02 7.02 7.02	8.67 8.67 10.67 20.57 10.67 20.57 11.67 2.65 0.596 0.11 97.79 6.327 0.596 0.596 0.596 0.596 0.596 0.596 0.596 0.596 0.596 0.596 0.596 0.596 0.597 1.259 6.327 0.695 2.691 2.65 0.595 0.544 0.595 0.595 0.595 0.544 0.595 0.595 0.595 0.544 0.595 0.595 0.544 0.595 0.544 0.555 0.544 0.545 0.555 0.555 0.555 0.555
Sample No Son Pie No Sin Pie No Sin Pie No Sin Pie No Nago Nago Nago Nago Nago Nago Nago Na	0.718 8(5-04 52.2 0.973 22.3 8.25 0.259 2.69 2.69 2.69 2.69 2.69 2.69 1.505 - - 3.002 2.69 0.247 89.79 1.505 - - 3.002 2.69 0.247 89.79 1.505 - - 3.002 2.69 0.247 89.79 1.505 - - 3.002 2.69 0.247 89.79 1.505 - - - 3.002 2.69 0.247 89.79 1.505 - - - - - - - - - - - - -	0.594 0.594 8.401 55.95 0.75 17.49 6.54 0.121 5.425 4.034 1.595 2.595 1.595 2.779 4.639 5.755 5.997 2.997 2.997 2.995 2.779 2.995 2.99	0.713 KS-1 53.1 0.72 9.4 0.21 1.57 0.427 0.	0.609 3 0.609 3 13 4 45 5 0.9 13 13 13 13 13 13 13 13 13 13	13.83 13.83 R-02 14 56 13.1 56 13.1 56 13.1 14 56 151 16 17.83 18 19 14 151 14 151 14 151 14 152 153 153 153 153 153 153 153 157 157 157 157 157 157 157 157 157 157 157 157 157 157 157 157 157 158 157 <tr< th=""><th>2.949 R-03 66.28 0.506 23.36 6.097 0.086 6.263 11.34 7.031 0.087 F.36 1.573 6.316 6.961 1.575 6.316 6.961 1.575 6.316 6.975 6.316 6.975 6.316 6.975 6.316 6.975 6.316 6.975 6.316 6.573 6.326 7.996 6.373 6.092 7.996 6.373 6.023 7.996 6.373 6.023 7.996 6.373 6.023 7.996 6.373 6.023 7.996 6.33 0.035 7.996 6.33 0.035 7.996 6.33 0.035 7.42 0.035 7.42 7.996 6.33 0.035 7.42 7.996 6.33 0.035 7.42 7.996 6.33 0.035 7.42 7.996 6.33 0.035 7.42 7.996 6.33 0.035 7.42 7.996 6.33 0.035 7.42 7.996 6.33 0.035 7.42 7.996 6.33 0.035 7.42 7.996 6.33 0.035 7.42 7.996 6.33 0.035 7.42 7.996 6.33 0.035 7.42 7.996 7.99 7.99</th><th>7.203 R-04 45.45 111 11.03 13.61 0.164 13.61 0.164 0.165 0.062 97.33 1.355 0.062 97.33 1.355 0.062 97.35 1.355 0.603 0.603 0.603 0.603 0.603 0.603 0.603 0.603 0.603 0.603 1.55 0.603 0.60</th><th>7.2' 3-45 41,24 0.725 25,56 7.45 0.725 25,56 7.45 0.551 0.551 0.05 5.15 12,25 - 1,55 2,765 - 12,25 - 0.1595 0.1</th><th>72 84 847. 647.</th><th>7.08 7.09 7.09 7.09 7.01 7.01 7.01 7.01 7.01 7.01 7.01 7.01</th><th>8.67 8.67 10.57 10.67 10.67 10.57 10.57 1.27 6.297 1.29 2.65 0.11 97.79 1.259 6.237 0.695 2.075 1.259 6.237 0.695 2.075 2.055 2.075 2.055 2.075 2.055 2.075 2.055 2.075 2.055 2</th></tr<>	2.949 R-03 66.28 0.506 23.36 6.097 0.086 6.263 11.34 7.031 0.087 F .36 1.573 6.316 6.961 1.575 6.316 6.961 1.575 6.316 6.975 6.316 6.975 6.316 6.975 6.316 6.975 6.316 6.975 6.316 6.573 6.326 7.996 6.373 6.092 7.996 6.373 6.023 7.996 6.373 6.023 7.996 6.373 6.023 7.996 6.373 6.023 7.996 6.33 0.035 7.996 6.33 0.035 7.996 6.33 0.035 7.42 0.035 7.42 7.996 6.33 0.035 7.42 7.996 6.33 0.035 7.42 7.996 6.33 0.035 7.42 7.996 6.33 0.035 7.42 7.996 6.33 0.035 7.42 7.996 6.33 0.035 7.42 7.996 6.33 0.035 7.42 7.996 6.33 0.035 7.42 7.996 6.33 0.035 7.42 7.996 6.33 0.035 7.42 7.996 6.33 0.035 7.42 7.996 7.99 7.99	7.203 R-04 45.45 111 11.03 13.61 0.164 13.61 0.164 0.165 0.062 97.33 1.355 0.062 97.33 1.355 0.062 97.35 1.355 0.603 0.603 0.603 0.603 0.603 0.603 0.603 0.603 0.603 0.603 1.55 0.603 0.60	7.2' 3 -45 41,24 0.725 25,56 7.45 0.725 25,56 7.45 0.551 0.551 0.05 5.15 12,25 - 1,55 2,765 - 12,25 - 0.1595 0.1	72 84 847. 647.	7.08 7.09 7.09 7.09 7.01 7.01 7.01 7.01 7.01 7.01 7.01 7.01	8.67 8.67 10.57 10.67 10.67 10.57 10.57 1.27 6.297 1.29 2.65 0.11 97.79 1.259 6.237 0.695 2.075 1.259 6.237 0.695 2.075 2.055 2.075 2.055 2.075 2.055 2.075 2.055 2.075 2.055 2
Sample No Source	0.718 K:5-04 55.2 0.9773 22.3 8.25 0.259 2.82 7.39 2.69 0.247 99.79 1.807 4.505 - 3.002 3.827 4.505 - 3.002 3.827 4.505 0.247 9.505 0.36 0.719 4.505 0.739 0.759 0	0.594 8.401 55.95 0.75 17.69 6.54 2.971 5.435 0.121 2.971 5.435 0.121 2.971 5.435 0.121 1.499 2.779 - - 4.634 2.779 - - 4.635 4.555 0.7 5.987 3.985 4.556 0.7 1.985 1.985 1.985 1.985 1.985 1.985 1.985 1.985 1.257 1.985 4.556 0.7 1.985 1	0.713 KS-1 53.1 0.72 9.4 0.73 9.4 0.21 1.92 0.21 1.92 0.60 99.7 1.92 0.60 99.7 1.92 0.60 99.7 1.92 0.60 99.7 1.97 0.62 0.62 0.62 0.57 1.97 0.62 0.62 0.57 1.97 0.62 0.55 0.55 0.62 0.55 0.62 0.55 0.62 0.55 0.62 0.55 0.62 0.55 0.62 0.55 0.62 0.55 0.62 0.55 0.62 0.55 0.62 0.55 0.62 0.55 0.62 0.55 0.62 0.55 0.62 0.55 0.62 0.55 0.62 0.55 0.55 0.62 0.55 0.62 0.55 0.62 0.55 0	0.609 3 0.609 3 0.609 3 0.609 3 0.609 3 0.609 3 0.609 3 0.609 3 0.6 3 0.7 4 0.6 3	13.85 R-02 84 56 11 56 13.83 56 13.83 56 13.83 56 13.83 56 13.83 141 152 153 163 163 163 164 1707 163 164 171 163 164 171 172 183 199 104 117 112 113 114 115 117 118 119 111 112 113 114 115 117 118 119 1111 1112 </th <th>1.959 R-03 66.38 0.506 3.3.36 6.097 0.086 6.097 0.086 6.097 0.086 6.097 0.086 6.097 0.086 6.097 0.086 6.262 0.087 97.26 1.573 6.316 5.9716 5.9716 7.321 6.7092 1.873 6.961 7.321 6.7092 1.878 6.973 2.092 1.878 6.973 8.974 0.996 1990.8 103.9 12.33 0.041 12.33 0.0255 103.9 2.3 534.6 12.3 13.46 </th> <th>7.203 R-04 45.45 1.11 15.05 13.61 0.164 1.13 11.53 1.6 0.405 0.405 0.405 0.405 97.33 1.6 0.405 0.405 97.33 1.225 9.017 2.199 2.199 2.199 2.199 2.199 2.465 0.465 2.107 0.449 0.465 2.107 0.449 0.465 2.107 0.449 0.465 2.107 0.449 0.465 2.107 0.449 0.465 2.107 0.449 0.465 2.107 0.449 0.465 2.107 0.449 0.465 2.10 0.465 2.10 0.465 2.11 5.13 19.35 0.460 2.53 19.35 0.460 2.11 5.13 19.35 0.460 2.11 5.13 19.35 0.460 2.11 5.13 19.35 0.460 2.11 5.13 19.35 0.460 2.11 5.13 19.35 0.460 2.11 5.13 19.35 0.460 2.11 5.43 0.44 5.43 0.44 5.43 0.44 5.43 0.44 5.44 5.44 5.44 5.44 5.44 5.44 5.44</th> <th>7.2 3.45 3.45 3.45 3.45 3.45 3.45 3.45 3.45 3.45 3.45 3.45 3.45 3.45 3.45 3.45 3.45 3.45 3.45 3.45 3.45 3.45 3.455 3.455 3.455 3.455 3.455 3.455 3.455 3.455 3.455 3.455 3.455 3.455 3.455 3.455 3.455 3.455 3.455 3.455 3.455 3.455 3.455 3.455 3.455 3.455 3.455 3.455 3.455 3.455 3.455 3.455 3.455 3.455 3.455 3.455 3.455 3.455 3.515 3.4555 3.515 3.515 3.515 3.515 3.515 3.515 3.515 3.515 3.515 3.515 3.515 3.515 3.515 3.515 3.515 3.515 3.515 3.515 3.515 3.515 3.515 3.515 3.515 3.515 3.515 3.515 3.515 3.515 3.515 3.515 3.515 3.515 3.515 3.515 3.515 3.515 3.515 3.515 3.515 3.515 3.515 3.515 3.515 3.515 3.515 3.515 3.515 3.515 3.515 3.555 3.515 3.555 3.515 3.555 3.555 3.555 3.515 3.555 3.555 3.555 3.555 3.555 3.555 3.555 3.555 3.555 3.555 3.555 3.555 3.555 3.555 3.555 3.555 3.555 3.555 3.555 3.555 3.555 3.555 3.555 3.555 3.555 3.555 3.555 3.555 3.555 3.555 3.555 3.555 3.555 3.555 3.555 3.555 3.555 3.555 3.555 3.555 3.555 3.555 3.555 3.555 3.555 3.555 3.555 3.555 3.555 3.555 3.555 3.555 3.555 3.555 3.555 3.555 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Sample No Son Pie No Sin Pie No Si Ci Higo MaQ MaQ Na Ci Na Ci Higa ACNK ACNK ACNK ACNK ACNK ACNK ACNK ACNK	0.718 8:5-04 52.2 0.973 32.3 8.25 0.259 2.69 2.69 2.69 2.69 2.69 2.69 1.507 4.505 4.505 0.267 2.602 2.827 4.505 0.267 2.69 2.69 1.507 4.505 0.719 4.505 0.719 2.69 2.79 2.69 2.79 2.69 2.79 2.69 2.79 2.69 2.79 2.69 2.79 2.69 2.75 2.75 2.75 2.75 2.75 2.75 2.75 2.75 2.15 2.35 2.15 2.35 2.55 2.55 2.55 2.55 2.55 2.55 2.55 2.55 2.55 2.55	0.594 0.594 8.401 55.95 0.75 17.49 6.54 0.121 5.425 4.024 2.57 0.235 95.51 1.499 2.779 4.439 2.779 4.439 2.779 5.752 5.997 2.5997 1.5992 5.955 5.997 1.595 5.997 1.595 5.997 1.595 5.997 1.595 5.997 1.595 5.997 1.595 5.997	0.713 0.713 KS-1 5.5.1 0.72 5.5.1 1.5 9.4 0.21 1.5 9.4 0.21 1.5 9.4 0.21 0.4 0.2 1.5 0.4 0.2 0.4 0.5 0.4 0.5 0.4 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5	0.609 3 0.609 3 13 4 45 5 0.0 3 13 13 13 13 13 13 13 13 13	13.83 R-02 84 R-02 84 8-02 84 8-02 84 8 8-02 84 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	2.949 R-03 66.38 6.097 0.056 6.097 0.056 6.097 0.056 6.265 11.34 7.05 7.36 1.594 6.373 6.373 6.374 6.374 6.374 6.374 6.374 6.374 6.374 6.374 6.375 6.374 6.375 6.374 6.375 6.374 6.375 6.374 6.375 6.374 6.375 6.374 6.375 6.374 6.375 6.374 6.375 6.374 6.375 6.374 6.375 6.374 6.375 6.374 6.375 6.374 6.375 6	7.205 R-04 45.45 111 115.05 13.61 0.164 13.61 0.164 13.61 0.164 13.61 0.065 0.06 0.06	7.2 3 -45 41,24 0.773 25,56 7.45 0.773 25,56 7.45 0.571 0.05 9,55 13,27 1.79 0.05 9,55 13,27 1.79 0.05 9,55 1,65 12,25 - - - - - - - - - - - - -	72 8.4 8.4 8.7 0.4 8.7 0.7 1.6 8.4 0.2 0.1 8.4 1.5 0.2 0.2 8.4 1.5 0.2 0.2 8.4 1.5 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2	7.08 7.09 7.09 7.09 7.09 7.09 7.01 7.09 7.01 7.09 7.01 7.09 7.01 7.09 7.02 7.09 7.09 7.09 7.09 7.09 7.09 7.09 7.09	8.47 8.47 43.81 1.67 20.57 1.67 2.45 2.45 0.594 0.594 0.595 0
Sample No Source of the second	0.718 K:5-04 55.2 0.9773 221.3 8.25 0.259 2.82 7.39 2.69 2.26 0.247 99.79 1.807 4.505 - 3.002 3.827 4.695 0.247 99.79 1.807 4.505 - 3.002 3.827 4.695 0.346 0.714 0.714 0.714 0.715 10.39 5.905 1.575 10.39 5.905 0.36 2.7.63 2.7.63 2.7.63 2.7.63 2.7.63 2.7.64 0.507 3.471 - 1.0.95 5.905 0.365 2.7.63 2.7.63 2.7.63 2.7.64 0.505 3.332.9 3.332.9 3.332.9 3.325 2.7.24	0.594 8.401 55.92 0.754 17.69 6.24 0.751 17.69 6.24 0.121 2.971 5.425 0.255 95.81 0.255 95.81 0.752 5.997 3.977 3.997 3.977 3.997 3.977 3.997 3.977 3.997 3.9777 3.9777 3.9777 3.9777 3.9777 3.9777 3.9777 3.9777 3.9777 3.9777 3.9777 3.9777 3.9777 3.97777 3.97777 3.97777 3.9777777777777777777777777777777777777	0.713 KS-1 53.1 0.73 9.4 0.73 9.4 0.21 1.92 0.21 1.92 0.60 99.7 1.92 0.60 99.7 1.92 0.60 99.7 1.92 0.60 99.7 1.92 0.60 99.7 1.92 0.60 99.7 1.92 0.60 99.7 1.92 0.60 99.7 1.92 0.60 99.7 1.92 0.60 99.7 1.92 0.60 99.7 1.92 0.60 99.7 1.92 0.60 99.7 1.92 0.60 99.7 1.92 0.60 99.7 1.92 0.60 99.7 1.92 0.60 99.7 1.92 0.60 9.4 0.59 1.92 0.60 9.57 1.92 0.60 9.57 1.92 0.60 9.57 1.92 0.60 9.57 1.92 0.60 9.57 1.92 0.62 0.62 0.62 0.57 1.93 0.62 0.62 0.62 0.62 0.62 0.62 0.62 0.62 0.62 0.57 1.93 0.62 0.62 0.62 0.57 1.93 0.62 0.62 0.57 1.93 0.62 0.62 0.57 1.93 0.62 0.62 0.57 1.93 1.51 0.62 0.57 1.93 1.51 1.51 1.51 0.63 9.12 0.62 0.57 1.93 1.51 1.51 1.51 1.51 1.51 1.51 1.51 1.51 2.63 9.77 2.63 9.77 2.63 9.77 2.63 9.77 2.63 9.77 2.63 9.77 2.63 9.77 2.63 9.77 2.63 9.77 2.63 9.77 2.63 9.77 2.63 9.77 2.63 9.77 2.63 9.77 0.65 9.77 0.65 9.77 0.65 9.77 0.65 9.77 0.65 9.77 0.65 9.77 0.65 9.77 0.65 9.77 0.65 9.77 0.65 9.77 0.65 9.77 0.65 9.77 0.65 9.77 0.65 9.77 0.77 0.75 9.77 0.75 9.77 0.75 7.53 9.77 0.75 7.53 9.77 0.75 7.53 7.53 7.55 7.	0.609 3 (1) 4 (5) 5 (1) 5	13.83 13.83 R-02 84 56 11 56 13 56 13 14 151 151 163 163 164 17 163 164 17 164 17 164 17 164 17 18 199 104 117 124 135 137 138 139 137 14 15 17 18 19 112 112 113 114 115 115 116 117 118 119	1.959 R-03 66.38 0.506 13.36 6.097 0.086 6.097 0.086 6.097 0.086 6.097 0.086 6.097 0.086 6.097 0.086 6.097 0.086 1.371 6.961 1.574 6.961 1.574 6.961 1.573 6.316 5.376 5.976 2.992 1.873 6.973 2.941 6.973 7.996 199.8 17.12 17.89 0.461 12.33 0.0233 193.46 0.233 12.42 12.43 13.44	7.203 R-04 45.45 1.11 15.05 13.61 0.164 1.61 0.164 0.405 0.4	7.2 3.45 3.45 3.45 3.45 3.45 3.45 3.45 3.45 3.45 3.45 3.45 3.45 3.45 3.45 3.45 3.45 3.45 3.45 3.45 3.45 3.45 3.455 3.465 3.465 3.465 3.465 3.465 3.465 3.465 3.465 3.465 3.465 3.465 3.465 3.465 3.465 3.465 3.465 3.465 3.465 3.465 3.465 3.465 3.465 3.465 3.465 3.465 3.465 3.465 3.465 3.465 3.465 3.465 3.465 3.465 3.465 3.465 3.465 3.4655 3.5118 4.4514 3.5118 4.4514 3.513 3.757 3.757 3.757 3.767 3.757 3.757 3.767 3.757 3.757 3.767 3.757 3.757 3.767 3.757 3.757 3.767 3.757 3.757 3.757 3.767 3.767 3.757 3.767 3.757 3.767 3.767 3.767 3.777 3.767 3.777 3.767 3.767 3.767 3.777 3.767 3.767 3.777 3.767 3.767 3.777 3.767 3.767 3.767 3.767 3.777 3.767 3.777 3.767 3.767 3.767 3.777 3.767 3.767 3.767 3.767 3.767 3.777 3.767 3.767 3.767 3.767 3.767 3.767 3.767 3.767 3.767 3.767 3.767 3.767 3.767 3.767 3.767 3.767 3.767 3.767 3.767 3.767 3.767 3.767 3.767 3.767 3.767 3.767 3.767 3.767 3.767 3.767 3.767 3.767 3.767 3.767 3.767 3.767 3.767 3.767 3.767 3.767 3.767 3.767 3.767 3.767 3.767 3.767 3.767 3.767 3.767 3.767 3.767 3.767 3.767 3.767 3.767 3.767 3.767 3.767 3.767 3.767 3.767 3.767 3.777 3.767 3.777 3.767 3.767 3.767 3.767 3.767 3.767 3.767 3.767 3.767 3.777 3.767 3.777 3.777 3.777 3.777 3.777 3.777 3.777 3.777 3.777 3.777 3.777 3.777 3.777 3.777 3.777 3.777 3.777 3.7777 3.777 3.7777 3.7777 3.7777 3.7777 3.7777 3.777777 3.77777 3.7777777 3.777777777777 3.77777	72 8. 87. 6.7. 164 8.8. 9.7. 7.0. 164 8.8. 9.7. 1.4. 9.7. 8.6. 9.7. 1.4. 9.7. 8.6. 9.7. 8.6. 9.7. 8.6. 9.7. 9.7. 9.7.	7.08 7.09 7.09 7.09 7.09 7.09 7.01 7.01 7.01 7.02 7.02 7.02 7.02 7.02 7.02 7.02 7.02	8.67 8.67 10.67 20.57 10.67 20.57 10.67 2.65 0.596 0.11 97.79 2.65 0.596 0.11 97.79 2.65 0.596 0.596 0.596 0.596 0.596 0.596 0.596 0.596 0.597 2.65 0.597 2.65 0.59
Sample No Son Star Son Star Star Star Star Star Star Star Star	0.718 K:5-04 52.2 0.9773 32.3 8.25 0.259 2.62 7.39 2.69 2.69 2.69 1.507 4.505 - 2.602 2.827 4.505 - 2.602 2.827 4.505 - 2.602 2.827 4.505 - 3.002 2.827 4.505 - 3.002 2.827 4.505 - 3.002 2.827 3.827 4.505 - 3.002 2.827 3.827 4.505 - 3.002 2.827 3.248 3.805 3.277 3.248 3.805 3.277 3.248 3.805 3.8777 3.8777 3.8777 3.8777 3.87777 3.8777777777777777777777777777777777777	0.594 8-01 55.92 0.75 17.69 6.54 0.121 2.971 5.625 4.026 4.026 2.33 0.235 95.91 1.699 2.779 - 4.635 5.957 2.991 0.5572 5.957 1.985 4.556 5.957 1.985 1.985 1.985 2.575 1.985 1.985 2.575 1.985 1.685 2.575 1.985 2.575 1.985 1.575 2.575 1.985 1.575 2.575 1.985 2.575 1.985 1.575 2.575 1.985 1.575 2.575 1.985 1.575 2.575 1.985 1.575 2.575 1.985 1.985 1.575 2.575 1.985 1.575 2.575 1.985 1.575 2.575 1.985 1.985 1.575 2.575 1.985 1.	0.713 KS-1 53.1 0.72 9.4 0.21 1.57 0.427 0.447 0.	0.609 3 4 5 6 5 6 7 5 6 7 7 1 6 7 7 1 1	13.83 R-02 84 R-02 84 8-02 84 85 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	2.959 R-03 66.335 0.506 2.3.36 6.097 0.086 6.097 0.086 6.097 0.086 6.097 0.086 6.097 0.086 6.097 0.087 8.301 0.097 8.364 8.961 1.573 6.316 5.976 7.321 6.364 7.996 3.973 8.012 7.9996 3.974.6 0.055 103.9 2.2 3.9 534.6 <t>2.7 534.6 2.341</t>	7.105 7.005 7.205 7.00 7.205 7.205 7.205 7.51 1.11 1.5 0.164 7.51 1.6 0.005 0.005 7.55 1.255 7.57 7.57 7.57 7.57 7.57 7.57 7.57	7.2 3.45 41.21 0.773 25.56 7.45 0.774 3.52 15.27 1.73 0.591 0.06 95.14 1.645 1.215 2.766 2.766 2.766 2.766 3.52 1.645 1.645 1.645 1.645 1.645 1.615 5.215 6.539 957.6 5.215 6.539 957.6 5.215 6.539 957.6 5.215 6.539 957.6 5.215 6.539 957.6 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.217 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.215 5.2	72 84 87 87 87 87 87 87 87 87 87 87	7.08 7.09 7.09 7.09 7.01 7.01 7.01 7.01 7.01 7.01 7.02 7.02 7.02 7.02 7.02 7.02 7.02 7.02	8.67 8.67 10.67 20.57 10.67 20.57 10.67 2.65 2.67 1.259 0.596 0.11 97.79 0.596 0.596 0.596 0.596 0.596 0.595 2.67 2.661 3.254 0.595 2.67 2.651 2.657 1.236 5.651 1.236 5.651 1.236 5.657 1.135 2.655 2.055 2.055 2.055 2.055 2.657 3.254 0.595 2.055 2.
Sampia No 20: 110: 41:01 Fr:01 Mis0 Ni;0 Fr:02 F	0.718 K:5-04 55.2 0.9773 221.3 8.25 0.259 2.52 7.29 2.69 2.26 0.247 99.79 1.807 4.505 - 3.002 2.857 4.695 0.247 99.79 1.807 4.505 - 3.002 2.857 4.698 0.346 0.719 4.505 - 3.002 3.827 4.698 5.002 3.657 3.471 - 10.39 5.998, 6 2.7.63 2.7.63 2.7.64 5.998, 6 2.7.63 2.7.64 5.998, 6 2.7.64 5.998, 6 2.18 3.321, 9 3.3, 651 2.7.24 8.405 2.7.24 8.405 2.7.24 8.405 2.7.24 8.405 2.7.24 8.405 2.7.24 8.405 2.7.24 8.405 2.7.24 8.405 2.7.24 8.405 2.7.24 8.405 2.552	0.594 8.401 55.92 0.754 17.69 6.24 0.751 17.69 6.24 2.971 5.425 0.235 9.235 0.235 9.235 0.235 9.235 0.235 9.235 0.779 - - 6.034 1.459 2.779 - - 6.035 1.459 2.779 - - 6.035 1.459 2.779 - - 6.035 2.595 2	0.713 KS-1 55.1 0.72 9.4 0.73 9.4 0.21 1.99 1.99 0.60 99.7 1.99 0.60 99.7 1.99 0.60 99.7 1.90 2.83 0.59 0.60 99.7 1.90 2.83 0.59 0.60 99.7 1.90 2.83 0.59 0.60 99.7 1.90 0.60 99.7 1.90 0.60 99.7 1.90 0.60 99.7 1.90 0.60 99.7 1.90 0.60 99.7 1.90 0.60 99.7 1.90 0.60 99.7 1.90 0.60 99.7 1.90 0.60 99.7 1.90 0.60 99.7 1.90 0.60 99.7 1.90 0.60 9.55 0.65 0.55 0.65 0.55 0.65 0.55 0.65 0.55 0	0.609 3 11 4 56 5 0.5 5	13.83 R-02 84 8-02 84 8-02 84 85 8 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1.999 2.999 R-03 66.33 0.506 2.3.36 3.01 0.086 6.097 0.086 6.097 0.086 6.097 0.086 6.097 0.086 6.097 0.086 6.097 0.086 6.961 1.374 5.916 5.916 5.976 7.321 4.708 6.961 1.573 6.376 7.321 6.7321 6.975 2.996 599.8 17.12 17.68 0.0333 103.9 2.3 3.34.6 2.3.3 3.34.6 2.3.3 3.34.6 2.3.4 15.15 15.35 3.606	7.203 7.404 7.203 7.404 7.411 15.05 13.61 0.164 7.411 11.33 1.6 0.405 0.405 0.405 7.411 11.33 1.6 0.405 7.421 1.6 0.405 7.421 1.233 7.471 7. 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	1.2 R-05 G1,23 C,745 C,745 C,745 C,745 C,745 C,745 C,745 C,745 C,745 C,291 O,291 O,26 S6 G1 C,291 O,26 S6 G1 C,291	72 8 67 64 164 5.5 2.1 1.1 2.2 64 3.4 6.2 3.4 6.2 3.4 6.2 3.4 6.2 3.4 6.2 3.4 6.2 3.4 7.7 3.4 7.7 3.4 7.7 3.4 7.7 3.4 7.7 3.4 7.7 3.4 7.7 3.4 7.7 3.4 7.7 3.4 7.7 3.4 7.7 3.4 7.7 3.4 7.7 3.5 5.5 3.5 5.5 3.5 3.2 3.5 3.2	7.08 7.09 7.09 7.09 7.09 7.01 7.01 7.01 7.01 7.01 7.01 7.01 7.01	8.67 8.67 10.67 10.67 10.67 10.67 10.57 10.57 10.57 10.57 10.57 1.59 2.65 0.596 0.11 97.79 2.65 0.596 0.595 0.542 0.595 0.542 0.595 0.542 0.595 0.542 0.542 0.595 0.542 0.542 0.542 0.542 0.542 0.542 0.542 0.542 0.542 0.542 0.545 0
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Condition during Crystallization of the Granitic Rocks

Normative data plot of Quartz - Albite - Orthoclase diagram after Tuttle and Bowen (1985), H_2O saturated liquidus field boundaries in the system for various water pressures. This diagram, Fig (10) indicates the granitic rocks in the study area lie within 2kb and 10 kb during crystallization. It can be suggested that the granitic rocks from the study area were consolidated under the low pressure condition. If the igneous rocks were assumed as crystallization at minimum pressure of 2kb, their liquid temperature can be estimated from the diagram showing the relationship between differentiation index and temperature at 2 kb water pressure.

Depth of the crystallization of the igneous rocks can be expressed from the schematic depth-temperature diagram (after Marmo, 1969), Fig (11). From this diagram, the liquidus temperatures are 680°C to 712°C, 690°C, 700°C for biotite granites, biotite-muscovite granite, biotite microgranite. Diorites and microdiorite crystallized at 750°C to 760°C, 760°C and then pyroxenites at 870°C to 940°C. Generally, it may be suggested that biotite granites, biotite-muscovite granite, biotite microgranite and biotite microgranite may crystallized at the depth of 22km to 24km, 24km, 22km. Diorites and microdiorite may differentiated at 25km and pyroxenites may be at the depth between 30 km to 33 km.

Tectonic Discrimination of the Granitoid Rocks

The configurations of tectonic environments for the granitic rocks of the study area were made by using Maniar and Piccoli (1989) classification schemes. SiO₂ versus K₂O diagram are shown to classify the tectonic environment into IAG+CAG+CCG+CEUG+POG +RRG and OP field. The granitic rocks of the study area fall within the IAG+CAG+CCG +CEUG+POG field. In plots of M/AFM (MgO/Al₂O₃ +FeO +MgO) versus F/AFM (FeO /Al₂O₃ +FeO +MgO) variation diagram and plots of C/ACF (CaO /Al₂O₃ +CaO + FeO) versus F/ACF (FeO/ Al₂O₃+CaO+FeO) variation diagram show the granitoid rocks of the study area fall within the IAG+CAG+CCG field. Again in the Shand's Index diagram, plots of the granitic rocks fall in the CAG and CCG field, Fig (12, A). According the above mentioned data, it can be safely considered that the granitoid rocks of the study area are orogenic granitoids. Therefore, the granitic rocks of the biotite granites, biotite-muscovite granite and biotite microgranite were formed on the continent relation to the subduction of an oceanic plate beneath the continent. Pearce et al (1984) postulated that the discrimination diagram to integrate granite geochemistry into the plate tectonic framework. In the Y versus Nb diagram; all granites in the study area fall in the field of Syn-COLG and VAG and Y+Nb versus Rb diagram indicates that all granite rocks are fitted in the VAG field. According to the above data, the syn-collision granites support mantle of crustal sources augmented by melt and fluids from subducted continental crust. The volcanic arc granite is generally depleted mantle sources enriched by a subduction fluid \pm interaction with continental crust. Batchelor and Bowden (1985) used to discriminate the tectonic setting of granite according to R_1 - R_2 binary (millication) diagram; Fig (12, B) indicates the granitoid rocks of the study area correspond to syn-collision zone.



Figure 2 SiO₂ - (Na₂O+K₂O)-(FeO+MgO) diagram showing the evolutionary trend of the gneous rocks (after Le Meitre, 1989)



Figure 3 Harker's variation diagrams showing the correlation between major oxides and trace elements Vs SiO₂ of the igneous rocks from the study area, Symbols as in Table (1)



Figure 4 Anorthite percent (An%) in normative plagioclase plotted against Differentiation Index (D.I) of Thornton and Tuttle (1960). Symbols as in Table (1)

Figure 5 Na₂O+K₂O/Al₂O₃ Vs SiO₂ variation diagram, showing the trend of differentiation (after Chappell and White, 1974), Symbols as in Table (1)

K₂O Vs SiO₂ variation Figure 6 diagram, showing the trend of differentiation (after Le Maitre, 2001), Symbols as in Table (1)

Figure 7 Na_2O+K_2O Vs SiO₂ diagram distinguishing between alkaline and subalkaline series, (after MacDonald, 1968). The granitic rocks in the study area fall in the subalkaline series of the study area, Symbols as in Table (1).

Figure 8 K₂O Vs Na₂O diagram for the granitic rocks of the study area, (after Chappell and White,



Figure 9 TAS diagram of Cox et. al. (1979) showing subalkaline series of the study area, Symbols as in Table (1)

Figure 10 Normative data plot of Quartz - Albite - Orthoclase ratio exhibits the granitic rocks in the study area have water pressure within 2 kb and 10 kb (after Tuttle and Bowen, 1985), Symbols as in Table (1)



Figurer 11 Temperature-differentiation index diagram for the igneous rocks of the study area, at 2 kb water pressure (after Piwinskii and Wyllie, 1970)



Figure 12 (A)Shand's Index diagram for granitic rocks of study area, which fall within the CAG and CCG field, Symbols as in Table (1) (B) R₁-R₂ binary (millication) diagram indicates the granitoid rocks of the study area correspond to syn-collision zone

Geochronology of the igneous rock of the study area

Biotite granite (MMK-5) cropped out at the northern part of Lakhin pogoda, Lattitude N $17^{\circ}14'16''$, Longitude E $97^{\circ}12'$ 46'' was sent to the geochemical and isotope laboratory at the ALS laboratory of Geological Survey of Japan for LA-ICPMS. Biotite granite gives the zircons age of 51.9 ± 0.7 Ma, Fig (13). The result from zircon crystallization suggests that the biotite granite was emplaced in Eocene.



Figure 13 Result of biotite granite at Latitude N 17° 14′ 16″, Longitude E 97° 12′ 46″, Accuracy of U/Pb age dating by using LA-ICPMS technique

Conclusion

Geologically, the study area is chiefly covered by igneous and metasedimentary rocks. Geochemically, plots of Harker's variation diagrams selected on major oxides and trace elements, Al₂O₃, TiO₂, Fe₂O₃, CaO, MgO, MnO and P₂O₅ are negatively correlated with SiO₂. Na₂O and K₂O are positively correlated with SiO₂. Ba, Sn, Nb, Zn, Rb, Zr, Y and Mo are positively correlated with SiO₂. Sr, Ni, Ce versus SiO₂ show decreasing of those elements with increasing of SiO₂ contents. The normative anorthite content against the Thornton and Tuttle Differentiation Index (TTDI) diagram, hornblendite and diorite contain proportionately more normative anorthite in plagioclase than the biotite granite. If the igneous rocks were assumed as crystallization at 2 kb water pressure, the liquidus temperatures are 680°C to 712°C, 690°C, 700°C for biotite granites, biotite-muscovite granite, biotite microgranite. Diorites and microdiorite crystallized at 750°C to 760°C, 760°C and then pyroxenites at 870°C to 940°C.Depth of the crystallization of the igneous rocks can be expressed from the schematic depth-temperature diagram (after Marmo, 1969), biotite granites, biotite-muscovite granite and biotite microgranite may crystallized at the depth of 22km to 24km, 24km and 22km. Diorites and microdiorite may differentiated at 25km and pyroxenites may be at the depth of 30 km to 33 km. According to Maniar and Piccoli (1989) diagrams; the granitic rocks of the study area fall in the IAG + CAG + CCG field. It can be safely considered that the granitoid rocks of the study area are Orogenic granitoids. Therefore, the granitic rocks of the biotite granites, biotite-muscovite granite and biotite microgranite were formed on the continent relation to the subduction of an oceanic plate beneath the continent. The tectonic setting of granite according to R_1 - R_2 binary (millication) diagram indicates the granitoid rocks of the study area correspond to syn-collision zone. Radiometric dating by zircon U-Pb method indicates that the age of biotite granite gives the zircons age of 51.9 ± 0.7 Ma. The result from zircon crystallization suggests that the biotite granite was emplaced in Eocene. According to Chappell and White (1974), the genetic types of granitic rocks of the study area are regarded as both I-type and S-type. S-type granites probably originated from the remelting of metasediments and I- type granites derived from the remelting of deep-seated igneous materials. Biotite granite contain two mica are considered as sedimentary protolith of S-type and some biotite granite are I-type. Harker's variation diagrams are not only

linear but also irregular or scatter. Binary plots of Na_2O Vs K_2O diagram of Chappell and White (1983) shows that the granitic rocks of the study area involve both I-type and S-type.

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