APPENDIX A

ANALYTICAL TECHNIQUES EMPLOYED IN THE PRESENT GEOCHEMICAL INVESTIGATIONS

Major Element

Rapid methods of silicate rock analysis employed by Shapiro and Brannock (1962) were used to determine the major oxides of the samples. SiO_2, Al_2O_3, TiO_2, total iron as Fe_2O_3, P_2O_5 and MnO_2 were determined by spectrophotometer (Beckman DU-2, American) by the development of coloured ions of the respective element and measuring their absorbance at specific wave length.

SiO_2 and Al_2O_3 were determined in an aliquot of solution "A" prepared by fusion and digestion of a known weight (0.1 gm) of the sample powder with sixteen pallets of NaOH in a nickle crucible. After cooling, the melts were acidified with 20 cc. of 1 : 1 HCl and boiled for ten minutes on a hot plate. Then the solutions were made to one litre.

Total iron as Fe_2O_3, TiO_2, P_2O_5 and MnO_2 were determined on separate aliquots of solution "B" prepared by digesting a known weight (0.5 gm) of sample powder in platimum crucible with hydrofluoric acid (25-30 ml) and one or two drops of sulphuric acid over a steam bath. After complete removal of hydrofluoric acid fumes the contents of the crucible were treated with 10 cc. of dilute nitric acid in a beaker and thoroughly heated for 15 minutes. After cooling the volume of the solution was increased to 250 ml.

Alkalis were analysed from an aliquot of above mentioned solution "B" on a flame photometer (EEL, England). FeO, CaO and MgO were determined on sample powder with hydrofluoric acid in a platinum crucible with tight fitting lids and subsequent titration against potasium dichromate for FeO and against EDTA (Ethylene-diamine-tetra-acetic acid) for CaO and MgO.

H_2O was determined by igniting the sample powder in a bulbous tube. The sample powder was dried at 105°C for two hours in a furnace before ignition.

To accomplish the analyses with highest possible degree of precision, both natural and synthetic standards were used. The natural standards used were PCC-1, BCR-1, AGV-1, GSP-1 and G-2. Before using any chemical for the preparation of synthetic standard, its blank was predetermined to find out the necessary correction factor. All the standards were treated in the same way as the unknown samples. Also, a reagent blank solution was set up with distilled water for each determination to remove the possible error due to reagent contamination.

Trace Elements

Rb, Ba, and Sr were determined using Phillips X-Ray Fluorescence equipment (PW-1310/50 generator with PW 1320 control cabinet). For this purpose pressed pallets of the sample powders with boric acid as backing material were made. Same natural standards as used in major oxide analyses were run along with the unknown samples. For each set of 9 unknown samples the above named natural standards were run before and after the unknown samples. For each determination at least two readings were taken to determine the average value.

Rest of the trace elements reported in this work were analysed by DC Arc emmission spectrography using Hilger large spectrograph with interchangeable glass and quartz prism. The finely ground samples mixed with an equal weight of carbon powder was burnt in a carbon electrode, in a 9 mmp DC arc, with the material in the cathode. Spectrograms were then compared in a Hilger Judd Lewis Comparator with those prepared in a like manner from standard mixtures with a matrix similar to that of the material being examined. In this type of analysis too, the same natural standards were used as reference. At least two arcs were made for each sample to determine the average value.

APPENDIX B

Sample wise chemical and normative composition of the thirty-two flows of the Panjal Traps

Sample No.	1/B	1/Mlr	1/Mup	1/T	2/B	2/Mlr	2/Mup	2/T	3/B	3/T	4/B	4/T	5/B	5/T	6/B	6/T
SiO_2	49.57	49.83	49.99	50.46	49.52	50.24	51.44	52.22	50.72	52.65	50.15	52.47	50.50	51.68	50.15	51.61
TiO_2	1.65	1.40	2.60	1.90	1.36	1.34	1.24	1.54	1.35	1.36	2.28	1.90	1.82	2.10	2.08	1.80
Al_2O_3	15.22	15.25	14.17	14.21	15.13	14.20	14.12	13.72	13.77	14.26	14.85	14.11	14.56	13.75	14.78	13.62
Fe_2O_3	2.25	2.34	1.90	2.11	1.87	2.42	2.40	1.65	1.96	2.12	1.93	2.37	2.20	1.96	1.76	2.60
FeO	7.22	8.25	10.12	9.28	7.45	7.75	7.92	9.47	9.70	9.51	9.10	8.46	8.70	9.37	10.00	9.31
MgO	5.63	5.47	5.25	5.41	5.91	6.44	6.21	5.31	6.08	5.37	6.34	5.25	7.66	5.68	5.50	5.36
CaO	14.16	13.95	12.65	11.50	13.15	12.66	11.62	10.52	11.21	9.40	11.15	9.82	10.55	9.58	10.14	9.26
Na_2O	2.20	1.87	2.05	2.20	2.55	2.53	2.45	2.95	2.45	2.25	1.74	2.00	1.80	2.70	1.95	2.85
K_2O	0.75	0.72	0.56	0.45	0.95	0.55	0.95	0.75	0.75	0.95	0.54	1.85	0.50	1.05	1.45	1.29
MnO	0.07	0.07	ND	0.10	0.08	0.05	0.13	0.10	0.10	0.12	0.14	0.09	ND	0.06	0.09	0.15
P_2O_5	0.16	0.17	0.18	0.14	0.15	0.15	0.07	0.13	ØND	0.10	0.19	0.17	0.13	0.12	0.15	0.15
H_2O	1.26	1.45	1.52	2.24	1.92	1.72	1.48	2.13	1.85	1.68	1.72	1.80	1.65	2.10	1.95	1.98
Total	100.14	99.98	99.99	100.00	100.04	100.11	100.03	100.10	100.14	99.97	100.13	100.29	100.09	100.15	100.10	99.98
SI	13.20	29.30	26.40	27.80	31.60	32.50	31.20	26.40	29.30	26.30	32.30	26.30	36.70	27.40	27.00	25.0
Al_2O_3/SiO_2	0.31	0.31	0.28	0.28	0.30	0.28	0.27	0.26	0.26	0.27	0.28	0.28	0.29	0.27	0.29	0.26
FeO^*/MgO	1.68	1.93	2.28	2.10	1.57	1.59	1.66	2.09	1.90	2.16	1.73	2.06	1.42	1.99	2.10	2.22
Fe_2O_3/FeO	0.31	0.28	0.18	0.22	0.25	0.31	0.30	0.17	0.20	0.22	0.21	0.28	0.25	0.21	0.17	0.28
NORM																
Q	0.30	0.60	2.16	4.32	-	-	1.74	1.98	1.86	5.16	4.68	5.64	4.14	2.88	2.40	2.22
Or	4.45	4.45	3.34	2.78	5.56	3.34	5.56	4.45	4.45	5.56	3.34	11.12	2.78	6.12	8.34	7.78
Ab	18.34	15.72	17.29	18.34	21.48	21.48	20.96	25.15	18.86	20.96	14.67	16.17	15.20	23.06	16.24	24.10
An	29.47	31.14	27.80	27.52	26.97	25.58	24.46	21.96	25.30	25.02	31.14	23.91	30.30	22.24	27.52	20.57
Ne	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Di Wo	16.70	15.54	14.27	11.95	15.66	15.26	13.46	12.30	12.64	8.70	9.74	9.98	8.82	10.21	9.16	10.21
Di En	9.80	8.30	6.70	6.10	9.00	8.90	7.60	5.90	6.30	4.40	5.40	5.40	5.30	5.30	4.60	5.20
Di Fs	6.07	6.73	7.39	5.54	5.94	5.54	5.28	6.20	6.07	4.09	3.96	4.22	3.04	4.62	4.36	4.75
Hy En	4.30	5.40	6.40	7.40	1.50	5.90	7.90	7.40	8.90	9.00	10.40	7.70	13.80	8.90	9.40	8.20
Hy Fs	2.64	4.36	7.00	6.73	0.92	3.70	5.41	7.52	8.05	9.37	7.66	6.20	8.05	7.66	9.24	7.52
Ol Fo	-	-	-	-	3.08	0.94	-	-	-	-	-	-	-	-	-	-
Ol Fa	-	-	-	-	2.45	0.78	-	-	-	-	-	-	-	-	-	-
Mt	3.25	3.48	2.78	3.02	2.78	3.48	3.48	2.32	2.78	3.02	2.78	3.48	3.25	2.78	2.55	3.71
Il	3.19	2.58	3.04	3.65	2.58	2.58	2.36	2.89	2.56	2.58	4.26	3.65	3.50	3.95	3.95	3.34
Ap	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	-	0.34	0.34	0.34	0.34	0.34	0.34	0.34

APPENDIX B - Continued

Sample wise chemical and normative composition of the thirty-two flows of the Panjal Traps

Sample No.	7/B	7/T	8/B	8/T	9/B	9/T	10	11/B	11/T	12/B	12/M	12/T	13/B	13/M	13/T	14/B
SiO_2	49.27	49.50	49.56	48.81	48.16	48.23	49.67	49.38	51.85	51.91	51.49	54.20	50.03	57.14	51.59	51.96
TiO_2	1.97	0.86	1.85	2.20	2.11	2.19	2.11	1.72	2.25	2.33	1.15	2.16	2.14	2.20	2.29	2.20
Al_2O_3	14.05	14.36	14.20	14.53	13.27	13.40	13.19	14.60	14.85	13.08	14.51	16.40	13.25	17.18	13.15	13.25
Fe_2O_3	1.75	2.13	1.92	1.70	1.45	1.26	0.85	0.98	1.26	1.87	1.40	1.15	1.35	1.87	2.23	2.34
FeO	9.45	10.45	9.20	10.10	9.14	9.50	8.17	8.36	9.30	10.00	9.18	7.70	8.58	7.05	10.28	9.38
MgO	7.43	6.28	7.10	6.81	7.80	5.87	5.56	5.56	4.34	4.75	6.63	4.26	5.73	3.91	5.31	4.60
CaO	10.20	9.37	11.10	10.35	11.02	10.80	11.27	10.27	6.69	7.62	9.61	7.94	10.47	5.87	8.18	9.35
Na_2O	2.55	3.20	2.15	2.85	3.70	3.55	3.88	3.94	4.20	3.75	3.10	3.12	3.25	2.23	3.14	3.19
K_2O	1.47	1.40	1.35	0.80	1.90	1.90	1.20	1.62	1.50	1.53	0.93	1.14	1.28	0.68	1.50	0.85
MnO	0.17	0.11	0.08	0.16	0.07	0.11	0.11	0.17	0.15	0.17	0.10	0.13	0.09	0.05	0.04	0.06
P_2O_5	0.10	0.12	0.12	0.22	0.12	0.15	0.21	0.39	0.21	0.28	0.14	0.16	0.23	0.13	0.12	0.15
H_2O	1.70	2.18	1.35	1.47	1.28	3.15	3.85	2.98	3.40	2.71	1.76	1.63	3.60	1.72	1.96	2.45
Total	100.04	100.00	99.98	100.00	100.02	100.11	100.07	99.97	100.00	100.00	100.00	99.99	100.00	100.03	100.06	99.96
SI	32.8	26.8	32.7	30.6	32.5	26.6	28.2	27.1	21.1	21.7	31.2	24.5	28.4	24.9	23.4	22.6
Al_2O_3/SiO_2	0.29	0.29	0.29	0.30	0.28	0.28	0.28	0.30	0.30	0.25	0.28	0.30	0.26	0.30	0.25	0.25
FeO^*/MgO	1.50	2.00	1.56	1.73	1.35	1.83	1.62	1.67	2.43	2.49	1.59	2.07	1.73	2.28	2.35	2.54
Fe_2O_3/FeO	0.18	0.20	0.21	0.16	0.16	0.13	0.10	0.10	0.14	0.19	0.15	0.15	0.16	0.26	0.21	0.25
NORM																
Q	-	-	-	-	-	-	-	-	-	0.48	-	6.60	-	19.98	-	4.14
Or	8.73	8.34	7.78	5.00	11.12	11.12	7.23	9.45	8.90	8.90	5.56	6.67	7.78	3.98	8.90	5.00
Ab	21.48	27.25	18.34	24.10	13.49	17.82	25.68	24.63	35.63	31.44	26.20	26.20	27.25	18.86	28.82	26.72
An	22.52	20.57	25.02	24.19	13.90	15.01	14.73	17.24	17.24	14.46	22.80	27.52	17.79	28.36	16.12	19.46
Ne	-	-	-	-	9.73	6.53	3.98	4.83	-	-	-	-	-	2.35	-	-
Di Wo	11.37	10.44	12.18	10.67	16.70	15.89	16.82	12.99	6.26	9.05	10.09	4.64	13.57	-	9.86	10.90
Di En	6.46	5.00	6.90	5.70	9.70	8.10	9.00	6.80	2.90	4.20	3.40	2.40	7.30	-	4.80	5.30
Di Fs	4.44	5.28	4.75	4.62	6.20	7.26	6.60	5.81	3.30	4.75	7.00	2.11	5.81	-	4.88	5.41
Hy En	3.80	-	7.90	4.40	-	-	-	-	5.70	7.70	9.60	8.30	2.60	9.80	8.50	6.20
Hy Fs	2.51	-	5.54	3.56	-	-	-	-	6.47	8.45	5.15	7.79	1.98	7.79	8.32	6.20
Ol Fo	5.91	7.49	1.96	4.76	6.86	4.48	3.36	4.90	1.54	-	2.42	-	3.08	-	-	-
Ol Fa	4.45	8.47	1.63	4.08	4.69	4.49	3.47	4.69	3.24	-	1.47	-	2.65	-	-	-
Mt	2.55	3.02	2.78	2.55	2.09	1.86	1.16	1.39	1.86	2.78	2.09	1.62	1.86	2.78	3.25	3.48
Il	3.80	1.67	3.50	4.26	3.95	4.10	3.95	3.34	4.26	4.41	2.13	4.10	4.10	4.26	4.41	4.26
Ap	0.34	0.34	0.34	0.67	0.34	0.34	0.34	1.01	0.34	0.67	0.34	0.34	0.67	0.34	0.34	0.34

APPENDIX B - Continued

Sample-wise chemical and normative composition of the thirty-two flows of the Panjal Traps

Sample No.	14/M	14/T	15/B	15/M	15T	16/B	16/M	16/T	17/B	17M	17T	18/B	18/M	18/T	19/B	19/M
SiO_2	48.89	50.38	51.65	49.78	51.49	52.78	52.31	51.57	49.26	45.96	47.47	55.00	54.04	57.10	54.34	56.59
TiO_2	2.09	2.09	2.11	2.10	2.15	2.18	2.23	2.05	2.00	2.07	2.06	1.65	1.55	1.72	1.53	1.71
Al_2O_3	13.05	13.25	14.69	15.09	14.89	14.70	14.90	13.77	14.40	14.64	14.70	13.37	13.10	14.12	13.98	15.30
Fe_2O_3	1.10	1.15	0.86	1.45	1.60	1.20	1.14	1.25	2.06	2.20	2.15	2.10	1.74	1.66	1.25	1.38
FeO	9.47	9.51	8.50	9.84	10.72	8.61	9.07	8.15	9.19	9.87	9.44	9.48	11.28	8.64	9.25	9.04
MgO	6.98	6.62	5.13	5.42	3.46	4.69	5.12	5.24	6.19	8.23	6.35	4.07	4.25	4.34	5.17	2.73
CaO	11.47	10.33	10.27	9.52	8.58	8.42	7.22	9.20	9.51	12.23	11.84	7.19	6.59	6.73	8.20	9.02
Na_2O	3.55	3.60	3.32	3.35	3.40	3.33	3.55	3.75	3.15	3.02	3.93	3.35	3.35	3.95	3.85	3.50
K_2O	1.70	1.80	1.05	1.20	1.40	1.09	1.45	1.72	1.35	0.70	0.80	1.45	1.65	0.29	3.37	0.20
MnO	0.04	0.04	0.25	0.09	0.17	0.05	0.09	0.14	0.05	0.12	0.07	0.12	0.10	0.06	0.05	0.14
P_2O_5	0.12	0.10	0.19	0.16	0.20	0.10	0.13	0.23	0.12	0.19	0.24	0.22	0.29	0.18	0.21	0.25
H_2O	1.74	1.32	2.04	1.98	2.17	2.83	2.80	2.90	2.76	1.77	1.95	1.93	1.97	1.21	1.87	1.35
Total	100.00	100.19	100.06	99.98	100.23	99.98	100.01	99.97	100.04	100.00	100.00	99.93	99.91	100.00	100.07	100.21
SI	30.60	27.90	27.20	25.50	16.60	25.40	25.20	26.10	28.20	35.80	28.80	19.90	19.10	23.00	25.90	17.20
Al_2O_3/SiO_2	0.27	0.26	0.28	0.30	0.29	0.28	0.28	0.27	0.29	0.32	0.31	0.24	0.24	0.25	0.26	0.27
FeO^*/MgO	1.51	1.55	1.82	2.08	3.64	1.99	1.99	1.79	1.81	1.46	1.85	2.84	3.06	2.37	2.04	[illegible]
Fe_2O_3/FeO	0.13	0.12	0.10	0.15	0.15	0.14	0.12	0.15	0.22	0.23	0.23	0.23	0.13	0.19	0.14	0.15
							NORM									
Q	-	-	-	-	0.96	3.18	1.20	-	-	-	-	7.02	4.02	[illegible]	[illegible]	[illegible]
Or	10.01	10.56	6.12	7.23	8.34	6.67	8.34	10.01	7.78	3.89	5.00	8.34	10.01	1.67	2.22	1.11
Ab	16.51	22.93	28.30	28.30	28.82	28.30	29.87	31.44	26.72	17.21	20.44	28.30	28.30	33.54	32.49	[illegible]
An	14.73	14.73	21.96	22.52	21.13	21.68	20.57	15.85	21.13	28.99	25.02	17.24	15.57	19.74	19.74	[illegible]
Ne	7.24	4.05	-	-	-	-	-	-	-	-	2.27	-	-	-	-	-
Di Wo	17.28	15.20	12.06	9.98	8.24	8.35	6.03	12.06	10.90	12.88	14.04	6.36	6.50	[illegible]	[illegible]	[illegible]
Di En	9.50	8.20	6.10	4.90	3.10	4.10	3.00	6.40	5.90	7.50	7.60	3.00	2.50	2.10	4.00	1.90
Di Fs	7.13	6.47	5.68	4.88	5.28	4.09	2.90	5.28	4.62	4.75	5.94	3.96	4.09	3.30	4.22	3.70
Hy En	-	-	5.50	2.00	5.60	7.60	9.80	2.00	1.90	-	-	7.20	8.10	8.70	8.90	4.90
Hy Fs	-	-	5.28	1.98	9.50	7.26	9.24	1.58	1.45	-	-	9.24	12.80	8.58	9.24	[illegible]
Ol Fo	5.60	5.88	0.84	4.69	-	-	-	3.36	5.32	9.17	5.88	-	-	-	-	-
Ol Fa	4.69	5.10	0.82	5.20	-	-	-	2.86	4.69	6.32	4.90	-	-	-	-	-
Mt	1.62	1.62	1.16	2.09	2.32	1.86	1.26	1.86	3.02	3.25	3.02	3.02	2.55	2.32	1.86	2.09
Il	3.59	3.95	3.95	3.95	4.10	4.10	4.26	3.95	3.80	3.95	3.95	3.19	2.89	3.27	2.89	3.19
Ap	0.34	0.34	0.34	0.34	0.67	-	0.34	0.34	-	0.34	-	0.67	0.67	0.34	0.34	0.67

APPENDIX B - Continued

Sample-wise chemical and normative composition of the thirty-two flows of the Panjal Traps

Sample No.	19/T	20/B	20/M	20/T	21/B	21/T	22/B	22/T	23/B	23/M	23/T	24/B	24/M	24/T	25/B	25/T
SiO_2	53.40	49.69	45.63	48.60	48.90	51.04	50.33	51.92	51.25	52.45	58.16	52.53	52.25	52.51	52.77	49.23
TiO_2	1.37	1.72	1.82	1.58	1.57	1.46	2.50	1.52	1.72	1.45	1.58	1.66	1.68	1.34	1.31	1.39
Al_2O_3	14.81	13.56	14.60	14.10	11.21	13.91	13.20	15.10	13.75	14.10	17.60	14.90	15.20	13.72	15.18	15.30
Fe_2O_3	2.35	2.10	2.22	1.21	1.34	1.16	1.91	2.49	2.29	2.15	1.12	1.64	1.55	2.24	1.37	2.27
FeO	9.35	8.16	9.84	8.72	10.58	8.96	10.68	10.47	9.25	8.00	7.28	8.34	8.18	9.05	7.28	8.98
MgO	3.69	8.03	7.49	6.85	5.10	6.15	5.00	4.19	4.29	5.07	3.19	5.82	5.71	6.72	5.81	6.24
CaO	7.90	10.31	12.04	11.42	14.44	10.19	9.59	9.10	10.75	9.50	6.40	9.83	9.96	10.13	9.93	9.80
Na_2O	3.10	2.70	3.53	4.10	3.55	3.39	2.66	2.70	4.65	4.27	2.15	2.21	2.30	2.25	3.53	4.39
K_2O	1.70	1.21	0.85	1.10	1.35	1.40	1.14	1.25	0.65	0.39	0.72	0.32	0.95	0.75	0.55	0.80
MnO	0.15	0.16	0.17	0.11	0.15	0.13	0.22	0.12	0.11	0.20	0.13	0.26	0.07	0.14	0.11	0.23
P_2O_5	0.27	0.21	0.29	0.25	0.18	0.10	0.14	0.17	0.13	0.17	0.25	0.31	0.18	0.10	0.19	0.23
H_2O	1.94	2.15	1.50	1.98	1.73	2.10	2.62	1.10	1.28	2.55	1.47	2.19	2.17	1.12	1.97	1.16
Total	100.03	100.00	99.98	100.02	100.10	99.99	99.98	100.04	100.00	100.00	100.05	100.01	100.20	100.07	100.00	100.02
SI	18.30	36.20	32.70	31.20	23.20	29.20	23.40	19.90	20.30	25.50	22.10	31.80	30.60	32.00	31.30	27.50
Al_2O_3/SiO_2	0.28	0.28	0.32	0.29	0.23	0.27	0.26	0.29	0.27	0.27	0.30	0.29	0.28	0.26	0.29	0.30
FeO^*/MgO	3.17	1.27	1.47	1.44	2.33	1.64	2.51	3.08	2.68	2.00	2.63	1.71	1.70	1.68	1.48	1.80
Fe_2O_3/FeO	0.25	0.25	0.22	0.14	0.13	0.13	0.18	0.24	0.25	0.27	0.15	0.20	0.19	0.24	0.19	0.25
NORM																
Q	4.68	-	-	-	-	-	2.22	3.36	-	-	19.98	7.80	4.92	4.44	0.96	-
Or	10.01	7.23	5.00	6.67	7.78	8.34	6.67	7.23	3.89	2.22	4.45	1.67	5.56	4.45	3.34	5.00
Ab	26.20	23.06	12.58	19.12	12.05	28.82	25.53	23.06	33.01	36.16	18.34	18.86	19.39	18.86	29.87	27.51
An	21.41	21.13	21.41	16.68	10.84	18.35	20.57	25.30	14.73	18.07	30.86	29.75	28.36	25.30	23.91	19.96
Ne	-	-	9.37	8.24	9.66	-	-	-	3.41	-	2.04	-	-	-	-	5.25
Di Wo	6.73	12.18	15.31	16.01	25.06	13.11	10.56	7.89	15.78	11.83	-	7.31	8.83	10.44	10.21	10.48
Di En	2.80	7.50	8.50	8.90	11.30	6.80	4.20	3.30	7.20	6.20	-	3.80	4.80	5.70	5.70	6.10
Di Fs	3.96	3.96	6.20	6.47	13.86	5.94	6.47	4.62	8.45	5.28	-	3.30	3.70	4.36	4.09	5.02
Hy En	6.40	5.20	-	-	-	0.24	8.30	7.20	-	5.80	8.00	10.80	9.50	11.10	8.80	-
Hy Fs	9.24	2.64	-	-	-	0.21	7.79	10.16	-	5.02	10.03	8.45	7.39	8.45	6.20	-
Ol Fo	-	5.18	7.14	5.74	1.12	5.85	-	-	2.52	0.49	-	-	-	-	-	6.65
Ol Fa	-	3.06	5.71	4.69	1.63	5.55	-	-	3.06	0.51	-	-	-	-	-	6.02
Mt	3.48	3.02	3.25	1.86	1.86	1.62	2.78	3.71	3.25	3.02	1.68	2.32	3.32	3.25	2.09	3.25
Il	2.58	3.34	3.50	3.04	3.04	2.74	4.71	2.89	3.19	2.74	3.04	3.19	3.19	2.58	2.48	2.58
Ap	0.67	0.34	0.67	0.67	0.34	0.34	0.67	0.34	0.34	0.34	0.34	0.67	-	0.34	0.34	0.67

APPENDIX B - Continued

Sample-wise chemical and normative composition of the thirty-two flows of the Panjal Traps

Sample No.	26	27/B	27/M	27/T	28/B	28/T	29/B	29/M	29/T	30/B	30/M	30/T	31/B	31/M	31/T	32/B	32/M	32/T
SiO_2	48.20	62.34	51.97	48.05	55.83	55.21	51.46	50.19	50.66	49.20	47.89	53.26	46.43	53.62	56.91	48.08	50.10	48.20
TiO_2	1.44	1.37	1.62	1.92	1.39	1.45	1.50	1.36	1.57	1.93	1.36	1.34	1.52	1.32	1.45	1.43	1.34	1.32
Al_2O_3	14.60	13.20	13.85	13.14	17.17	17.12	14.27	13.25	13.19	13.26	14.04	15.32	14.15	16.16	17.24	14.07	14.41	14.21
Fe_2O_3	3.23	1.75	1.83	2.40	1.10	1.13	1.86	3.07	2.58	2.17	2.33	1.49	2.97	2.68	1.15	1.78	2.11	2.47
FeO	9.05	6.46	8.53	9.75	6.42	6.18	8.43	8.18	10.13	9.04	10.46	6.76	9.84	8.55	6.48	8.36	9.10	9.38
MgO	7.13	3.14	4.68	5.28	3.56	3.45	5.60	5.24	5.31	6.24	6.94	5.34	6.23	3.91	3.46	8.62	5.71	5.96
CaO	9.97	5.17	10.07	12.80	8.44	7.63	9.43	10.81	9.69	9.86	10.21	9.10	11.52	7.39	7.62	11.53	9.66	10.18
Na_2O	3.50	3.20	4.15	4.00	2.70	3.20	3.90	3.90	3.10	3.65	3.50	3.50	4.75	4.10	3.47	3.35	3.55	3.20
K_2O	1.15	1.15	1.65	0.75	1.64	1.75	1.66	1.09	1.59	1.48	1.70	1.35	0.40	1.15	0.61	0.55	1.50	1.15
MnO	0.16	0.07	0.17	0.10	0.02	0.12	0.07	0.14	0.20	0.17	0.09	0.20	0.19	0.06	0.02	0.18	0.15	0.11
P_2O_5	0.10	0.12	0.14	0.22	0.30	0.14	0.09	0.16	0.18	0.14	0.15	0.27	0.29	0.13	0.14	0.25	0.19	0.17
H_2O	1.67	2.05	1.59	1.77	1.80	2.62	2.00	2.72	1.80	2.87	1.42	2.13	1.71	1.51	1.60	1.79	2.18	3.65
Total	100.20	100.02	100.25	100.18	100.10	100.00	100.26	100.13	100.00	100.01	100.09	100.06	100.03	100.22	100.15	99.99	100.00	100.00
SI	30.20	20.10	22.50	23.80	23.10	22.00	27.20	24.30	23.40	27.60	27.80	30.70	25.80	19.20	22.80	38.00	26.00	27.00
Al_2O_3/SiO_2	0.30	0.21	0.27	0.27	0.31	0.31	0.27	0.26	0.26	0.28	0.30	0.29	0.30	0.30	0.25	0.29	0.29	0.29
FeO^*/MgO	1.72	2.58	2.21	2.30	2.11	2.06	1.80	2.15	2.39	1.79	1.84	1.35	2.05	2.87	2.20	1.17	1.96	1.38
Fe_2O_3/FeO	0.36	0.27	0.21	0.25	0.17	0.18	0.22	0.37	0.25	0.24	0.22	0.22	0.30	0.31	0.18	0.21	0.23	0.26
NORM																		
Q	-	21.48	-	-	9.12	6.90	-	-	-	-	-	-	-	1.98*	11.10	-	-	-
Or	6.67	6.67	10.01	4.49	9.45	10.56	10.01	6.67	9.45	8.90	10.01	10.00	2.22	6.67	3.34	3.34	8.90	6.67
Ab	24.23	27.25	30.00	19.13	23.06	27.25	31.70	28.82	26.20	25.81	17.55	29.34	18.08	34.58	29.34	21.48	28.30	25.68
An	20.85	18.07	14.18	15.57	29.75	26.97	16.40	15.29	17.24	15.29	17.79	22.24	16.12	22.24	29.75	21.68	18.90	20.85
Ne	2.77	-	2.84	7.95	-	-	0.85	2.27	-	2.77	6.39	-	12.07	-	-	3.69	0.85	0.85
Di Wo	11.60	2.78	14.62	19.37	5.10	4.18	12.30	15.66	12.53	13.69	13.34	8.93	16.47	5.68	3.02	14.15	11.83	12.18
Di En	6.60	1.30	7.10	9.60	2.50	2.10	6.50	8.20	6.00	7.50	6.90	5.10	8.60	2.60	1.50	8.60	6.10	6.20
Di Fs	4.49	1.45	7.26	9.37	2.51	1.98	5.41	7.00	6.24	5.68	6.07	3.43	7.39	3.04	1.45	4.75	5.54	5.68
Hy En	-	6.60	-	-	6.40	6.50	-	-	3.90	-	-	2.70	-	7.20	7.20	-	-	-
Hy Fs	-	7.00	-	-	6.07	6.34	-	-	4.22	-	-	1.98	-	8.32	7.13	-	-	-
Ol Fo	7.84	-	3.22	2.52	-	-	4.76	3.36	2.38	5.60	7.28	4.06	4.90	-	-	9.10	5.74	6.16
Ol Fa	5.71	-	3.67	2.65	-	-	4.18	2.65	2.86	4.69	6.94	3.06	4.69	-	-	5.51	5.71	5.71
Mt	4.64	2.55	2.55	3.48	1.62	1.62	2.78	4.41	3.71	3.25	3.48	2.09	4.41	3.94	1.62	2.55	3.02	3.48
Il	2.58	2.43	2.58	3.65	2.58	2.74	2.89	2.58	3.04	3.65	2.58	2.58	2.89	2.58	2.74	2.74	2.58	2.58
Ap	0.34	0.34	0.34	0.67	-	0.34	0.34	0.34	0.34	0.34	0.34	0.67	0.67	0.34	0.34	0.67	0.34	0.34

B, M, and T represent bottom, middle, and top locations of a flow; Mlr and Mup represent lower and upper locations respectively of the middle part of a flow.

$FeO^* = F_2O_3 + FeO$