

## Chemical compositions of the constituent minerals of the Gazo mass, a tectonic block in the Sambagawa metamorphic belt, Besshi district, central Shikoku, Japan

Tsuyoshi Sakurai

### Abstract

The Gazo mass is an eclogite-bearing tectonic block within the Sambagawa metamorphic belt, central Shikoku, Japan. Chemical compositions of constituent minerals in pelitic and basic schists and eclogites from the Gazo mass have been analyzed by EPMA. Garnets contain <13 mol% of the pyrope molecule and <35 mol% grossular. Clinopyroxenes are aegirine-augite and omphacite. Amphiboles are both sodic-calcic (magnesiokatophorite, katophorite, magnesiotalamite, taramite and barroisite) and calcic (edenite, ferroedenite and magnesiohornblende). The white micas present are paragonite and phengite.

**Key words;** Sambagawa metamorphic belt, Gazo mass, eclogite, chemical composition, garnet, clinopyroxene, amphibole, paragonite, phengite, chloritoid

### Geological outline of the Sambagawa metamorphic belt in the Besshi district

The Sambagawa metamorphic belt is a high-pressure intermediate group metamorphic belt, which is located to the south of the Median Tectonic Line in southwest Japan. The Sambagawa metamorphic belt exposed in central Shikoku consists of the Besshi and the Oboke nappe complexes (Takasu and Dallmeyer, 1990). The Besshi nappe complex includes tectonic blocks with variety of protolith and metamorphic history (Takasu, 1989; Takasu et al., 1994). The Besshi nappe complex exposed in central Shikoku is divided into four metamorphic zones based on the index minerals; chlorite, garnet, albite-biotite and oligoclase-biotite zones in ascending order of metamorphic grade (Higashino, 1990 a, b).

### Geology of the Gazo mass

The Gazo mass of eclogite-bearing tectonic block is located to the northeast of the Iratsu epidote amphibolite mass (Fig. 1). The Sambagawa schists where the Gazo mass occurs belong to the albite-biotite zone. The Gazo mass shows a layer form with 70 m in thickness and extends for more than 750 m. There are no faults or shear zones between the Gazo mass and the Iratsu mass, but ultramafic rocks occasionally occur between the pelitic schists of the Gazo mass and the epidote amphibolites of the Iratsu mass. The Gazo mass is composed of alternation of pelitic and basic schists (Fig. 2). Eclogites occur as lenses or layers in basic schists (Sakurai and Takasu, 1999, 2000).

The constituent minerals of pelitic schists are quartz, phengite, albite, garnet, chlorite, coaly matter, paragonite,

titanite, rutile, tourmaline, iron minerals, amphibole, epidote, biotite and chloritoid and those of basic schists are amphibole, epidote, garnet, quartz, phengite, rutile, titanite, carbonate minerals, apatite, albite, chlorite and iron minerals. Eclogites consist of the constituent minerals of the basic schists and clinopyroxene, biotite and talc.

### Mineral chemistry

The chemical compositions of the constituent minerals in the pelitic and basic schists including eclogites from the Gazo mass were determined by electron probe microanalyser (JEOL JXA-8800 M) of the Research Center for Coastal Lagoon Environments, Shimane University. The analytical conditions are accelerating voltage: 15 kV, specimen current:  $2 \times 10^{-8}$  A and beam diameter: 3~10  $\mu$ m. The correction procedure follows Bence and Albee (1968). The chemical compositions of garnet, clinopyroxene, amphibole, white mica, epidote, chloritoid and talc are represented in Tables 1-6.

#### 1. Garnet

Garnets in the pelitic and basic schists and eclogites show almandine-rich compositions (Fig. 3), and they contain up to 13 mol% of pyrope molecule, and up to 35 mol% of grossular molecule.

#### 2. Clinopyroxene

Clinopyroxenes occurring in the matrix and as inclusions in garnet, amphibole and epidote are classified into aegirine-augite and omphacite (Morimoto, 1988). Symplectitic clinopyroxenes with albite are omphacite. Aegirine molecule was estimated based on assumption of  $Fe^{3+}=Na-Al$ . The matrix and inclusion clinopyroxenes contain 16~44 mol% of jadeite content. The jadeite contents increase from

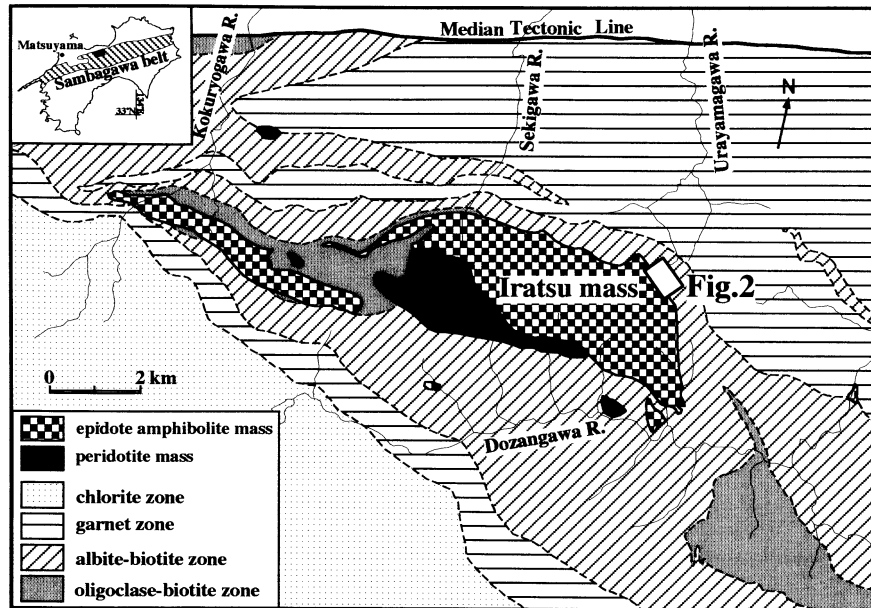


Fig. 1. Tectonic blocks and metamorphic zonation in the Besshi district (modified after Higashino, 1990 b).

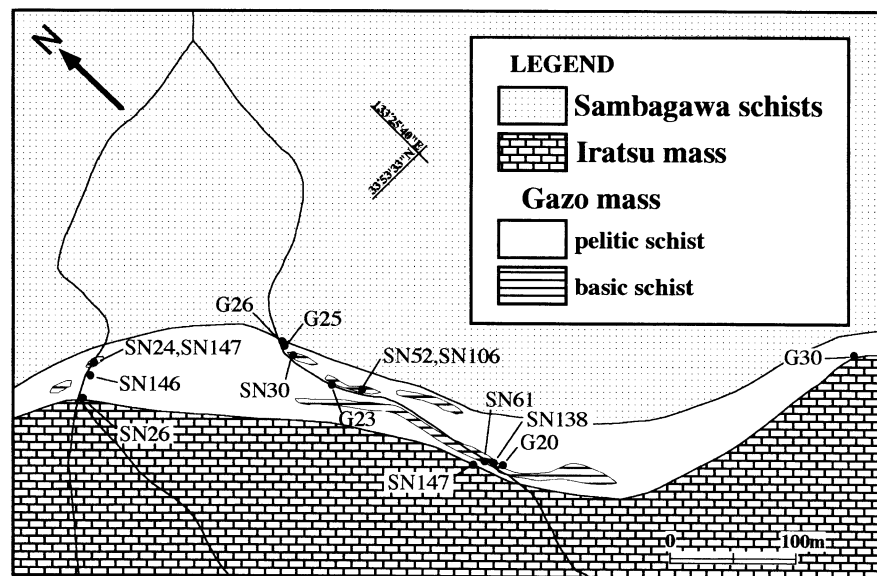


Fig. 2. Lithological map of the Gazo mass and localities of analyzed samples in this study.

core to rim. Symplectitic clinopyroxenes contain 14~20 mol% of jadeite molecule (Fig. 4).

### 3. Amphibole

Amphiboles are classified into calcic amphiboles (edenite, ferroedenite and magnesiohornblende) and sodic-calcic amphiboles (magnesiokatophorite, katophorite, magnesio-taramite, taramite and barroisite) (Leake et al., 1997) (Fig. 5). The amphiboles in basic schists are classified into edenite, magnesiohornblende, magnesiokatophorite and barroisite with NaB of 0.38~0.97. The amphiboles in

eclogites are classified into edenite, ferroedenite, magnesiohornblende, magnesiokatophorite, katophorite, magnesio-taramite and taramite with NaB of 0.33~0.99. The amphibole in pelitic schists are classified into barroisite with NaB of 0.65~0.83.

### 4. White mica

White micas in pelitic schists are phengite (Si=6.49~6.85, Na/(Na+K)=0.05~0.16) and paragonite (Si=5.52~6.15, Na/(Na+K)=0.85~0.99) (Fig. 6). Paragonites occurring as inclusions in garnets contain CaO up to 2.7 wt%.

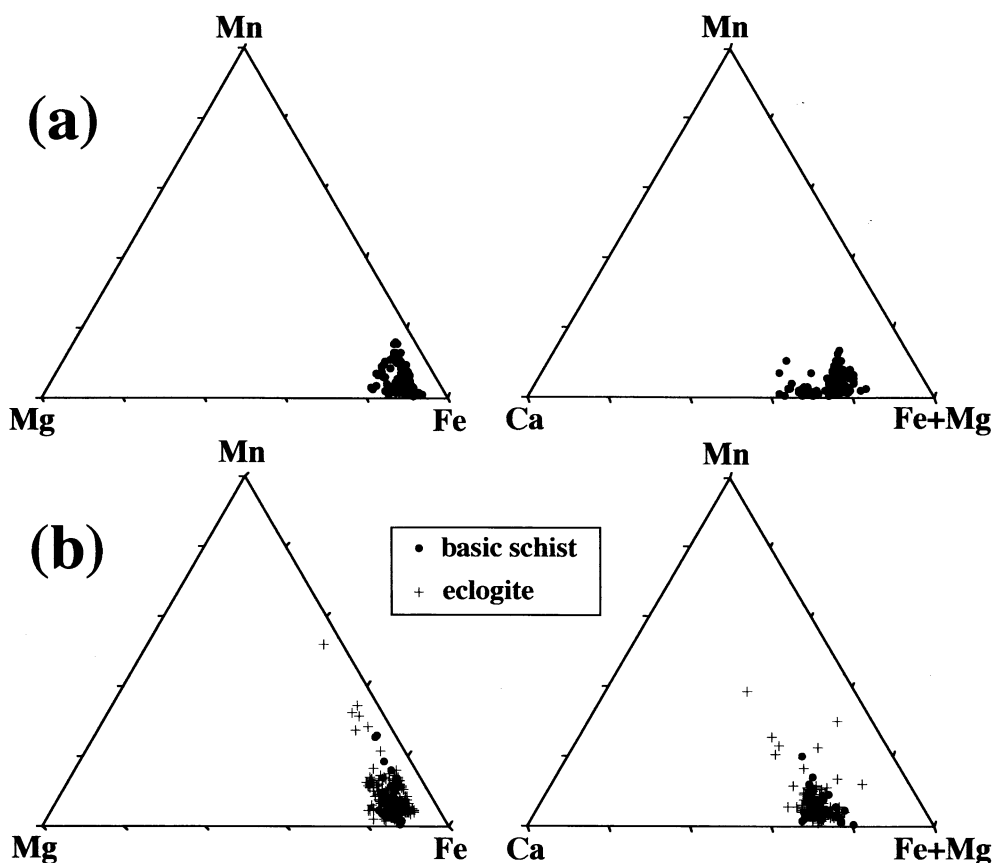


Fig. 3. Chemical composition of garnet. (a) garnet in pelitic schists. (b) garnet in basic schists and eclogites.

5. Epidote

Pistatite molecules in the epidotes in the eclogites ranges from 0.21 to 0.31 and decreases from core to rim.

6. Other minerals

Chloritoid rarely occurs as inclusion in garnet. Mg/(Mg+Fe+Mn) in chloritoid ranges from 0.15 to 0.17. Talc occurs in quartz-rich layers in the basic schists. Mg/(Mg+Fe) in talc ranges from 0.81 to 0.82.

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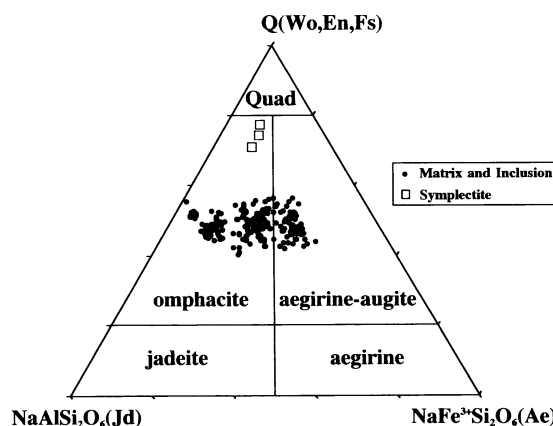
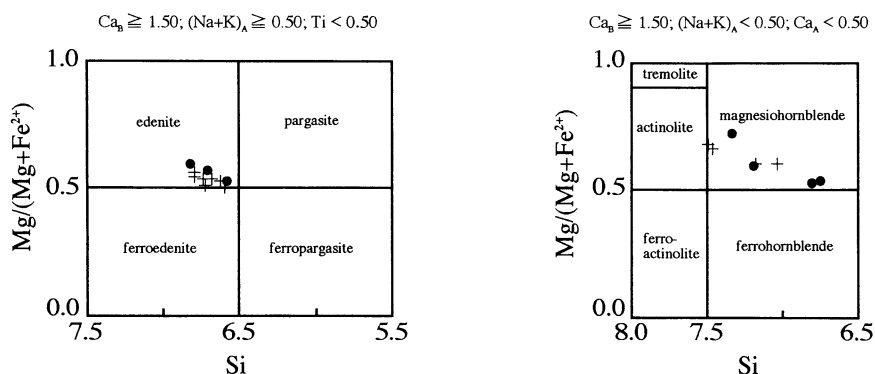


Fig. 4. Chemical composition of clinopyroxene (after Morimoto, 1988).

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### calcic amphiboles



### sodic-calcic amphiboles

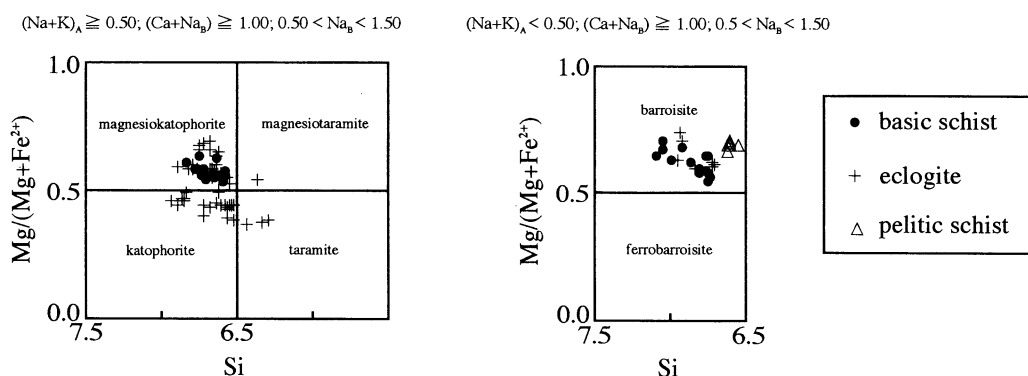


Fig. 5. Classification of amphiboles (after Leake et al., 1997).

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\* In Japanese with English abstract

\*\*In Japanese

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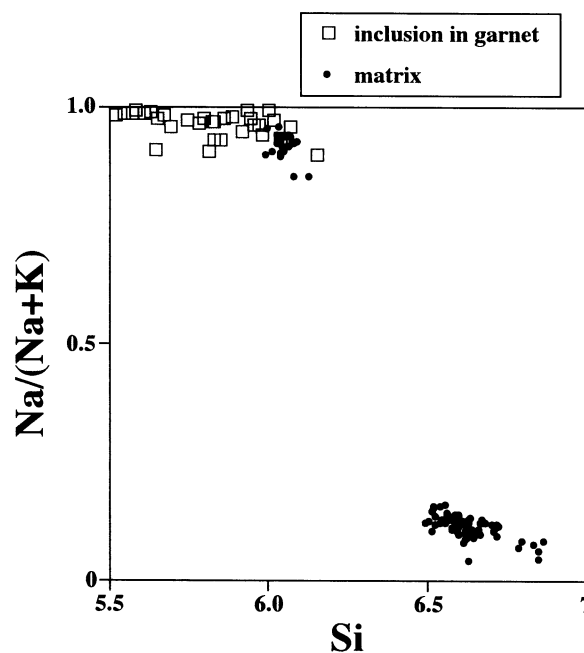


Fig. 6. Chemical composition of white mica.

## (要 旨)

櫻井 剛, 2000, 四国中央部三波川変成帯別子地域峨藏岩体の鉱物化学組成, 島根大学地球資源環境学研究報告, 19, 167-185

四国中央部三波川変成帯には大小様々なテクトニック・ブロックが存在する。峨藏岩体は五良津岩体の北東部に位置するエクロジャイトを含むテクトニック・ブロックである。今回峨藏岩体を構成する岩石の鉱物(ざくろ石, 単斜輝石, 角閃石, 白色雲母, 緑れん石, クロリトイド, タルク)の EPMA 分析による化学組成を示した。

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Table 1. Chemical compositions of garnets

Lithology	pelitic schist																					
	G20									G25						G26						
Sample	intermediate			core						intermediate			rim			intermediate			rim		core	
No.	2	3	5	6	12	16	18	19	20	22	23	1	3	5	7	9	10	11	8	10		
SiO <sub>2</sub>	37.75	37.97	37.72	37.58	37.55	37.23	37.71	37.37	37.50	37.58	37.91	38.20	37.64	37.31	37.30	37.28	37.89	37.83	37.21	37.45		
TiO <sub>2</sub>	0.11	0.08	0.15	0.10	0.09	0.17	0.08	0.33	0.10	0.13	0.06	0.09	0.01	0.08	0.04	0.03	0.04	0.07	0.05	0.06		
Al <sub>2</sub> O <sub>3</sub>	20.47	20.36	20.39	20.44	20.69	20.67	20.62	20.65	20.54	20.29	20.75	20.94	20.64	20.49	20.77	20.31	20.75	20.71	20.34	20.58		
FeO*	31.61	31.71	30.79	31.82	30.48	30.77	31.45	30.55	30.64	30.87	29.36	28.13	32.29	32.40	32.49	33.14	26.24	27.00	29.80	30.62		
MnO	0.41	0.36	0.44	0.88	2.49	2.43	1.31	0.91	0.61	0.32	0.30	0.45	1.88	3.00	2.76	1.75	1.70	0.65	5.97	4.64		
MgO	1.53	1.50	1.60	1.43	1.34	1.26	1.81	1.51	2.35	1.47	1.63	2.19	1.61	1.20	1.17	1.36	1.58	1.68	0.95	0.99		
CaO	8.46	8.32	8.90	8.25	7.82	7.94	7.39	8.55	7.79	8.96	10.40	10.45	6.12	5.92	5.73	6.19	11.73	11.46	5.58	6.06		
Total	100.34	100.29	99.98	100.50	100.45	100.47	100.37	99.87	99.54	99.61	100.42	100.45	100.18	100.39	100.25	100.06	99.93	99.41	99.90	100.39		
Cation per 12 oxygens																						
Si	3.020	3.037	3.023	3.011	3.008	2.989	3.016	3.000	3.011	3.025	3.013	3.017	3.024	3.010	3.008	3.015	3.015	3.020	3.020	3.019		
Ti	0.007	0.005	0.009	0.006	0.010	0.005	0.020	0.006	0.006	0.008	0.004	0.005	0.001	0.005	0.002	0.002	0.002	0.004	0.003	0.004		
Al	1.930	1.919	1.925	1.930	1.954	1.957	1.944	1.954	1.944	1.925	1.944	1.950	1.955	1.949	1.975	1.936	1.946	1.949	1.946	1.955		
Fe	2.115	2.121	2.063	2.132	2.042	2.066	2.104	2.051	2.058	2.078	1.952	1.858	2.170	2.186	2.192	2.241	1.746	1.803	2.023	2.064		
Mn	0.028	0.024	0.030	0.060	0.169	0.165	0.089	0.062	0.042	0.021	0.020	0.030	0.128	0.205	0.189	0.120	0.114	0.044	0.410	0.317		
Mg	0.183	0.178	0.191	0.170	0.160	0.151	0.216	0.181	0.281	0.177	0.193	0.257	0.193	0.144	0.141	0.164	0.187	0.200	0.115	0.119		
Ca	0.725	0.713	0.764	0.708	0.671	0.683	0.634	0.735	0.670	0.772	0.886	0.885	0.527	0.512	0.495	0.536	1.000	0.981	0.486	0.523		
Total	8.008	7.998	8.005	8.018	8.010	8.022	8.007	8.003	8.011	8.005	8.011	8.003	7.997	8.011	8.002	8.015	8.010	8.001	8.003	8.000		
*Total Fe as FeO																						

Lithology	pelitic schist																						
	SN52D					SN146.2					SN26A												
Sample	rim		core			rim		core			rim			core			intermediate			rim		core	
No.	14	15	6	7	1	8	9	10	11	12	4	6	10	11	14	15	16	1	2	3			
SiO <sub>2</sub>	37.68	38.01	37.31	37.18	37.60	37.20	37.27	37.53	37.80	38.05	38.51	37.69	37.06	37.23	37.12	37.69	37.40	37.72	37.12	37.47			
TiO <sub>2</sub>	0.14	0.06	0.05	0.05	0.06	0.07	0.05	0.00	0.05	0.05	0.02	0.09	0.07	0.13	0.08	0.06	0.07	0.21	0.04	0.03			
Al <sub>2</sub> O <sub>3</sub>	20.62	21.11	20.63	20.54	20.39	20.29	20.21	20.30	20.94	20.93	21.30	20.78	20.86	20.60	20.86	20.75	20.93	20.83	20.61	20.83			
FeO*	25.13	28.22	31.35	31.15	28.48	31.67	28.03	27.37	27.36	26.61	25.98	32.12	30.22	29.65	29.73	30.36	31.98	25.43	28.77	28.50			
MnO	3.21	0.37	2.64	3.12	0.59	1.35	0.57	1.12	1.41	1.17	1.01	0.86	4.29	4.67	3.69	2.52	0.85	0.82	0.88	0.42			
MgO	1.04	2.57	1.33	1.42	1.79	1.96	2.23	1.87	1.89	2.34	2.82	1.63	1.30	1.34	1.46	1.55	1.78	2.95	2.18	2.04			
CaO	12.23	9.86	6.92	6.61	10.76	6.98	10.33	10.49	10.73	11.00	10.57	7.33	6.52	6.41	6.56	6.97	7.03	10.87	9.00	9.87			
Total	100.05	100.20	100.23	100.07	99.67	99.50	98.68	98.68	100.18	100.15	100.21	100.50	100.32	100.03	99.50	99.89	100.04	98.83	98.59	99.15			
Cation per 12 oxygens																							
Si	3.006	3.006	3.004	3.002	3.011	3.008	3.009	3.026	3.002	3.010	3.024	3.013	2.986	3.004	3.001	3.026	3.001	3.006	3.001	3.005			
Ti	0.008	0.004	0.003	0.003	0.004	0.004	0.003	0.000	0.003	0.003	0.001	0.005	0.004	0.008	0.005	0.004	0.004	0.013	0.002	0.002			
Al	1.939	1.968	1.958	1.954	1.925	1.934	1.923	1.929	1.960	1.952	1.971	1.958	1.981	1.960	1.988	1.964	1.979	1.957	1.964	1.969			
Fe	1.676	1.866	2.111	2.103	1.908	2.142	1.892	1.846	1.817	1.761	1.706	2.147	2.036	2.001	2.010	2.038	2.145	1.695	1.945	1.912			
Mn	0.217	0.025	0.180	0.213	0.040	0.092	0.039	0.076	0.095	0.078	0.067	0.058	0.292	0.319	0.253	0.171	0.058	0.055	0.060	0.028			
Mg	0.123	0.302	0.160	0.171	0.213	0.236	0.268	0.225	0.224	0.276	0.330	0.195	0.156	0.161	0.175	0.185	0.213	0.350	0.262	0.244			
Ca	1.046	0.835	0.597	0.572	0.923	0.605	0.893	0.907	0.913	0.933	0.889	0.628	0.563	0.555	0.568	0.600	0.605	0.928	0.780	0.849			
Total	8.016	8.006	8.013	8.018	8.023	8.021	8.027	8.009	8.014	8.012	7.989	8.003	8.019	8.008	8.000	7.988	8.005	8.003	8.015	8.009			
*Total Fe as FeO																							

Lithology	pelitic schist																			
	SN106A																			
Sample	core			rim			rim			core			intermediate			rim		core		
No.	4	5	6	7	9	10	11	12	13	14	15	16	25	26	27	28	41	1	2	3
SiO <sub>2</sub>	37.14	37.23	37.20	36.85	37.57	37.35	37.91	37.86	37.39	37.61	36.89	36.79	37.15	36.96	37.00	36.89	36.74	38.02	37.87	37.48
TiO <sub>2</sub>	0.12	0.08	0.11	0.09	0.08	0.07	0.06	0.12	0.07	0.04	0.06	0.06	0.03	0.02	0.02	0.03	0.08	0.02	0.08	0.00
Al <sub>2</sub> O <sub>3</sub>	20.53	20.62	20.51	20.39	20.30	20.77	21.20	21.06	20.79	20.95	20.42	20.54	20.27	20.59	20.72	20.44	20.58	21.07	20.79	20.83
FeO*	31.34	31.30	30.92	30.98	30.11	29.13	26.26	25.09	27.91	29.01	32.18	32.38	31.60	32.49	32.45	32.36	30.62	26.90	26.77	28.20
MnO	0.60	1.20	1.16	1.22	0.49	0.60	0.87	0.86	1.35	0.38	0.58	0.65	1.19	0.75	0.84	0.78	2.28	0.73	0.98	2.50
MgO	1.68	1.70	1.68	1.56	2.34	2.81	3.16	2.89	1.70	1.86	1.79	1.74	1.53	1.54	1.63	1.58	1.38	2.34	1.99	2.46
CaO	7.60	7.51	7.68	7.57	8.00	7.78	9.83	11.37	10.43	10.42	7.12	7.22	6.92	7.19	6.73	6.85	7.35	10.80	10.71	7.89
Total	99.02	99.63	99.38	98.66	98.87	98.51	99.29	99.26	99.64	100.27	99.04	99.37	98.69	99.54	99.39	98.94	99.02	99.87	99.19	99.42
Cation per 12 oxygens																				
Si	3.009	3.002	3.005	3.003	3.030	3.010	3.006	3.002	2.995	2.992	2.997	2.984	3.026	2.993	2.997	3.003	2.990	3.012	3.024	3.005
Ti	0.008	0.005	0.007	0.005	0.005	0.004	0.004	0.007	0.004	0.002	0.004	0.004	0.002	0.001	0.001	0.002	0.005	0.001	0.005	0.000
Al	1.960	1.960	1.953	1.959	1.930	1.973	1.981	1.968	1.962	1.965	1.956	1.964	1.946	1.966	1.978	1.961	1.974	1.967	1.957	1.968
Fe	2.123	2.111	2.089	2.111	2.031	1.963	1.742	1.664	1.869	1.930	2.187	2.196	2.153	2.201	2.198	2.203	2.084	1.782	1.788	1.891
Mn	0.041	0.082	0.079	0.084	0.034	0.041	0.058	0.058	0.092	0.025	0.040	0.045	0.082	0.051	0.058	0.054	0.157	0.049	0.066	0.173
Mg	0.203	0.204	0.203	0.189	0.281	0.337	0.374	0.342	0.203	0.220	0.216	0.210	0.186	0.186	0.197	0.192	0.168	0.276	0.237	0.295
Ca	0.660	0.649	0.676	0.661	0.691	0.671	0.835	0.966	0.895	0.888	0.620	0.628	0.604	0.624	0.584	0.598	0.641	0.916	0.917	0.678
Total	8.004	8.013	8.012	8.013	8.000	8.000	8.000	8.007	8.020	8.023	8.021	8.030	7.999	8.023	8.013	8.014	8.018	8.004	7.993	8.010
*Total Fe as FeO																				

Lithology	basic schist																			
	SN147B																			
Sample	core			rim			rim			core			intermediate			rim		core		
No.	4	5	6	8	9	10	11	12	13	14	15	16	17	10	11	12	13	14	15	16
SiO <sub>2</sub>	37.26	37.26	37.30	37.23	37.28	37.29	37.12	37.00	37.02	37.38	37.26	37.19	37.35	38.15	37.90	37.60	37.21	37.71	37.46	37.62
TiO <sub>2</sub>	0.02	0.10	0.08	0.13	0.15	0.15	0.16	0.18	0.10	0.02	0.09	0.05	0.04	0.03	0.03	0.06	0.05	0.02	0.11	0.06
Al <sub>2</sub> O <sub>3</sub>	20.54	20.51	20.91	20.43	20.53	20.43	20.15	20.25	20.19	20.51	20.55	20.78	20.71	20.						

Table 1. (Continued)

Lithology Sample	basic schist SN30B						basic schist SN24B						eclogite SN24								
	rim	← core	→	rim	intermediate	← core	→	rim	intermediate	← core	→	rim	core	rim	rim	rim	intermediate	← core	→	rim	
No.	9	11	12	13	6	7	8	9	16	17	4	6	37	40	44	55	57	59	6	9	
SiO <sub>2</sub>	37.66	37.66	37.67	37.51	37.59	37.27	37.25	37.22	37.88	38.05	37.70	37.81	38.05	37.91	38.04	38.00	37.34	38.34	37.38	38.39	
TiO <sub>2</sub>	0.03	0.14	0.07	0.08	0.05	0.06	0.10	0.11	0.10	0.00	0.00	0.07	0.01	0.06	0.02	0.09	0.20	0.06	0.05	0.07	
Al <sub>2</sub> O <sub>3</sub>	20.14	19.99	19.88	19.91	20.44	19.91	19.53	19.74	20.99	20.95	20.75	20.91	21.02	21.45	21.42	20.84	19.95	20.87	20.63	21.06	
FeO*	29.06	28.04	27.36	29.62	28.99	26.97	25.18	25.27	26.57	26.26	26.80	28.96	28.41	26.09	25.29	27.67	26.82	27.66	28.16	26.19	
MnO	0.79	3.32	3.26	1.49	4.06	6.47	9.14	9.28	0.76	1.36	3.24	1.36	1.88	2.78	2.65	1.77	4.91	1.82	3.43	2.80	
MgO	2.12	2.39	2.10	1.89	1.67	1.35	0.99	0.93	2.43	2.68	1.85	1.92	2.40	2.40	2.48	2.41	1.85	2.37	1.09	2.38	
CaO	9.43	8.41	9.35	9.14	7.46	8.14	7.99	7.87	11.25	10.47	9.65	9.33	8.55	9.74	10.31	9.24	9.44	9.21	9.31	9.51	
Total	99.23	99.95	99.70	99.64	100.25	100.15	100.19	100.42	99.97	99.76	100.00	100.35	100.33	100.42	100.21	100.02	100.51	100.33	100.04	100.39	
Cation per 12 oxygens																					
Si	3.029	3.019	3.026	3.022	3.016	3.010	3.020	3.011	3.000	3.015	3.009	3.007	3.016	2.992	3.001	3.018	2.993	3.032	3.003	3.028	
Ti	0.002	0.009	0.004	0.005	0.003	0.003	0.006	0.006	0.006	0.000	0.000	0.004	0.001	0.004	0.001	0.005	0.012	0.004	0.003	0.004	
Al	1.909	1.888	1.883	1.890	1.933	1.895	1.866	1.883	1.959	1.956	1.952	1.960	1.964	1.996	1.991	1.950	1.885	1.946	1.953	1.958	
Fe	1.954	1.880	1.838	1.995	1.945	1.822	1.707	1.710	1.759	1.740	1.789	1.926	1.883	1.723	1.668	1.837	1.798	1.829	1.892	1.728	
Mn	0.054	0.225	0.222	0.102	0.276	0.442	0.628	0.636	0.051	0.091	0.219	0.092	0.126	0.186	0.177	0.119	0.333	0.122	0.234	0.187	
Mg	0.254	0.285	0.251	0.227	0.200	0.163	0.120	0.112	0.286	0.316	0.220	0.227	0.284	0.282	0.292	0.285	0.221	0.279	0.130	0.280	
Ca	0.813	0.723	0.805	0.789	0.641	0.704	0.694	0.682	0.954	0.889	0.825	0.795	0.726	0.824	0.872	0.786	0.811	0.780	0.801	0.804	
Total	8.015	8.029	8.029	8.029	8.014	8.039	8.041	8.041	8.015	8.007	8.015	8.010	8.001	8.006	8.002	8.002	8.053	7.991	8.017	7.989	
*Total Fe as FeO																					

Lithology Sample	eclogite SN30																			
	rim	rim	←	core	→	rim	rim	rim	intermediate	← core	→	rim	rim	rim	intermediate	← core	→	rim		
No.	14	16	20	12	13	16	17	19	21	22	23	24	26	28	31	32	33	40	43	4
SiO <sub>2</sub>	37.80	36.85	38.17	37.44	37.28	37.46	37.06	36.81	37.11	36.81	37.19	37.00	37.26	37.38	37.25	37.35	37.56	37.33	37.23	37.26
TiO <sub>2</sub>	0.05	0.06	0.06	0.01	0.10	0.01	0.09	0.07	0.04	0.08	0.08	0.08	0.04	0.10	0.13	0.06	0.00	0.03	0.05	0.09
Al <sub>2</sub> O <sub>3</sub>	20.91	18.62	21.07	20.11	19.87	19.79	19.70	19.50	19.47	19.11	19.54	19.67	19.29	19.10	19.59	19.33	19.46	19.42	20.24	20.47
FeO*	25.71	33.00	25.42	29.09	28.26	28.90	30.25	29.33	28.99	20.90	29.86	29.58	30.76	31.52	30.51	29.17	29.53	29.42	29.34	27.85
MnO	4.46	5.53	3.17	1.78	2.00	2.01	2.06	4.10	4.10	11.74	4.31	3.67	1.96	1.17	1.45	1.98	1.59	1.64	1.73	2.86
MgO	2.31	2.07	2.50	1.83	1.78	1.75	1.33	1.30	1.41	0.98	1.34	1.38	1.55	1.44	1.56	1.60	1.71	1.86	1.84	1.87
CaO	8.40	4.19	10.04	9.74	10.29	9.88	8.72	8.42	8.25	9.90	7.96	8.12	8.72	8.67	9.43	9.85	9.82	9.37	9.31	9.70
Total	99.63	100.31	100.41	99.99	99.57	99.81	99.21	99.53	99.37	99.51	100.28	99.49	99.57	99.39	99.91	99.34	99.68	99.07	99.73	99.30
Cation per 12 oxygens																				
Si	3.017	3.017	3.011	3.006	3.005	3.017	3.016	3.002	3.022	3.005	3.011	3.010	3.027	3.042	3.010	3.029	3.032	3.030	2.998	2.989
Ti	0.003	0.003	0.003	0.001	0.006	0.001	0.006	0.004	0.003	0.005	0.005	0.005	0.003	0.006	0.008	0.004	0.000	0.002	0.003	0.005
Al	1.967	1.797	1.960	1.903	1.889	1.879	1.890	1.874	1.869	1.899	1.865	1.886	1.847	1.832	1.866	1.847	1.852	1.858	1.921	1.935
Fe	1.716	2.260	1.677	1.954	1.906	1.946	2.059	2.001	1.974	1.427	2.022	2.012	2.090	2.145	2.062	1.978	1.994	1.997	1.976	1.869
Mn	0.302	0.383	0.212	0.121	0.136	0.137	0.142	0.283	0.283	0.811	0.295	0.253	0.135	0.081	0.099	0.136	0.109	0.112	0.118	0.181
Mg	0.274	0.252	0.293	0.219	0.213	0.210	0.161	0.158	0.171	0.119	0.162	0.168	0.187	0.175	0.187	0.193	0.206	0.225	0.220	0.224
Ca	0.718	0.368	0.848	0.838	0.889	0.853	0.760	0.736	0.720	0.866	0.691	0.708	0.759	0.756	0.816	0.856	0.849	0.815	0.803	0.834
Total	7.997	8.081	8.005	8.042	8.044	8.043	8.034	8.057	8.041	8.071	8.051	8.042	8.047	8.036	8.049	8.044	8.042	8.039	8.039	8.038
*Total Fe as FeO																				

Lithology Sample	eclogite SN30																			
	← core →	intermediate	rim	rim	rim	←	core →	intermediate	rim	rim	rim	←	core	→	rim	rim	rim	intermediate		
No.	6	7	10	13	14	15	16	19	20	21	46	54	1	7	12	14	15	16	17	18
SiO <sub>2</sub>	37.83	37.60	37.62	37.81	37.63	38.01	37.76	37.35	37.87	37.84	37.71	37.75	37.61	37.30	37.42	37.63	37.32	37.47	37.59	37.80
TiO <sub>2</sub>	0.12	0.13	0.07	0.10	0.09	0.03	0.07	1.57	0.17	0.14	0.02	0.04	0.08	0.07	0.11	0.05	0.00	0.02	0.07	0.07
Al <sub>2</sub> O <sub>3</sub>	20.50	20.31	21.10	20.44	20.60	20.89	20.87	19.80	20.52	20.47	21.01	20.60	20.41	20.53	19.95	20.58	20.51	20.62	20.58	20.73
FeO*	26.23	27.86	26.04	25.91	28.24	25.77	25.91	25.37	25.67	27.16	25.12	25.55	28.50	27.92	26.52	28.09	28.69	28.83	28.69	28.17
MnO	3.40	2.79	3.55	4.12	2.04	3.64	3.76	4.31	4.78	3.28	4.11	3.90	2.15	4.30	5.18	3.58	3.94	1.87	2.37	1.89
MgO	2.10	1.78	2.46	2.44	2.04	2.59	2.64	2.34	2.39	2.23	2.70	2.60	1.50	1.03	0.90	1.38	1.16	1.42	1.60	1.64
CaO	9.61	9.78	9.08	9.05	9.72	9.30	9.03	9.64	8.91	9.24	9.68	9.29	9.68	9.03	10.33	8.98	8.83	9.20	9.50	9.63
Total	99.79	100.24	99.91	99.87	100.35	100.24	100.04	100.37	100.30	100.37	100.34	99.72	99.92	100.17	100.40	100.28	100.45	99.44	100.39	99.91
Cation per 12 oxygens																				
Si	3.020	3.006	2.994	3.017	2.999	3.011	3.001	2.974	3.012	3.011	2.987	3.010	3.015	3.000	3.009	3.012	2.997	3.016	3.003	3.019
Ti	0.007	0.008	0.004	0.006	0.005	0.002	0.004	0.094	0.010	0.008	0.001	0.002	0.005	0.004	0.006	0.003	0.000	0.001	0.004	0.004
Al	1.929	1.914	1.978	1.922	1.934	1.950	1.955	1.858	1.923	1.920	1.962	1.937	1.929	1.946	1.891	1.942	1.941	1.956	1.937	1.952
Fe	1.751	1.863	1.733	1.729	1.882	1.707	1.722	1.689	1.707	1.808	1.664	1.704	1.911	1.878	1.783	1.880	1.927	1.940	1.917	1.881
Mn	0.230	0.189	0.239	0.279	0.137	0.245	0.253	0.290	0.322	0.221	0.275	0.264	0.146	0.293	0.353	0.242	0.268	0.127	0.160	0.128
Mg	0.250	0.212	0.291	0.290	0.242	0.306	0.313	0.277	0.283	0.264	0.319	0.309	0.179	0.124	0.107	0.164	0.138	0.171	0.191	0.195
Ca	0.822	0.838	0.774	0.774	0.830	0.790	0.769	0.822	0.759	0.788	0.822	0.794	0.832	0.778	0.890	0.770	0.760	0.794	0.813	0.824
Total	8.009	8.029	8.013	8.016	8.029	8.012	8.017	8.004	8.016	8.020	8.030	8.019	8.016	8.023	8.039	8.014	8.032	8.005	8.025	8.002
*Total Fe as FeO																				

Lithology Sample	eclogite SN30																			
	rim	rim	←	core	→	rim	rim	rim	intermediate	← core	→	rim	rim	rim	intermediate	← core	→	rim		
No.	19	23	24	25	26	27	28	29	34	35	36	37	38	39	40	41	42	43	44	45
SiO <sub>2</sub>	37.64	37.24	37.08	37.09	37.20	36.99	36.88	36.92	37.23	37.30	37.24	37.30	36.78	36.59	37.16	36.50	37.10	36.77	36.67	36.95
TiO <sub>2</sub>	0.08	0.12	0.12	0.05	0.02	0.08	0.10	0.11	0.12	0.08	0.03	0.15	0.17	0.11	0.08	0.12	0.12	0.07	0.05	0.05
Al <sub>2</sub> O <sub>3</sub>	20.42	20.56	20.35	20.59	2															

Chemical compositions of the constituent minerals of the Gazo mass, a tectonic block  
in the Sambagawa metamorphic belt, Besshi district, central Shikoku, Japan

Table 1. (Continued)

Lithology																					
Sample																					
No.	46	47	48	94	95	96	97	98	99	100	102	103	106	107	110	112	129	131	intermediate	2	3
SiO <sub>2</sub>	37.26	37.19	36.92	37.95	37.31	37.67	37.27	37.71	37.61	37.51	37.44	37.80	37.61	37.48	37.43	37.71	37.69	37.99	37.59	37.59	37.42
TiO <sub>2</sub>	0.04	0.05	0.06	0.03	0.01	0.10	0.09	0.02	0.11	0.15	0.07	0.02	0.14	0.13	0.11	0.12	0.05	0.03	0.06	0.07	
Al <sub>2</sub> O <sub>3</sub>	20.75	20.76	20.52	20.14	20.26	20.20	20.01	20.27	20.17	20.11	20.33	20.52	20.31	20.41	19.81	19.70	19.88	20.23	19.91	20.02	
FeO*	27.63	26.71	27.58	29.07	28.64	29.20	28.43	29.17	29.97	30.16	30.12	29.08	29.14	28.98	30.23	28.77	29.37	29.38	28.52	29.12	
MnO	2.61	2.31	2.33	1.64	1.92	1.58	2.13	1.21	1.40	1.55	1.63	2.25	1.66	1.71	1.66	2.32	2.05	1.68	2.02	1.72	
MgO	1.85	1.80	1.86	1.66	1.64	1.57	2.04	1.20	1.20	1.22	1.44	1.55	1.55	1.62	1.50	1.55	1.58	1.70	1.49	1.64	
CaO	9.13	9.59	9.50	9.53	9.44	9.41	9.24	9.29	9.01	9.07	8.88	8.88	9.74	9.40	9.50	9.53	9.32	9.57	9.19	9.39	
Total	99.27	98.42	98.77	100.01	99.22	99.72	99.20	98.87	99.47	99.76	99.91	100.09	100.14	99.73	100.24	99.69	99.92	100.57	98.77	99.37	
Cation per 12 oxygens																					
Si	2.998	3.007	2.990	3.037	3.013	3.026	3.010	3.048	3.034	3.023	3.012	3.025	3.012	3.010	3.011	3.038	3.031	3.028	3.046	3.021	
Ti	0.003	0.003	0.004	0.002	0.001	0.006	0.005	0.001	0.007	0.009	0.004	0.001	0.008	0.008	0.006	0.007	0.003	0.002	0.004	0.004	
Al	1.968	1.979	1.958	1.900	1.928	1.913	1.905	1.932	1.918	1.911	1.927	1.936	1.917	1.932	1.879	1.870	1.884	1.900	1.901	1.905	
Fe	1.859	1.806	1.868	1.946	1.934	1.961	1.920	1.972	2.022	2.033	2.027	1.946	1.951	1.946	2.034	1.938	1.975	1.958	1.933	1.966	
Mn	0.178	0.158	0.160	0.111	0.131	0.107	0.146	0.083	0.096	0.106	0.111	0.153	0.113	0.116	0.113	0.158	0.139	0.114	0.138	0.118	
Mg	0.221	0.216	0.225	0.198	0.198	0.188	0.246	0.144	0.144	0.146	0.173	0.185	0.185	0.193	0.180	0.186	0.190	0.202	0.180	0.198	
Ca	0.788	0.831	0.824	0.818	0.817	0.810	0.799	0.805	0.779	0.784	0.766	0.761	0.836	0.809	0.819	0.822	0.803	0.817	0.798	0.812	
Total	8.015	8.001	8.028	8.011	8.022	8.011	8.032	7.985	8.000	8.012	8.020	8.006	8.022	8.016	8.043	8.020	8.024	8.021	8.000	8.023	
*Total Fe as FeO																					
Lithology																					
Sample																					
No.	6	8	10	11	14	16	17	18	21	22	23	24	26	27	29	30	31	35	rim	36	37
SiO <sub>2</sub>	37.48	37.04	37.57	37.52	37.04	37.52	37.06	37.34	37.30	37.22	37.13	36.98	37.72	37.12	37.21	37.37	37.29	37.30	37.37	37.65	
TiO <sub>2</sub>	0.08	0.07	0.09	0.03	0.05	0.07	0.10	0.00	0.02	0.07	0.11	0.08	0.03	0.09	0.14	0.08	0.11	0.06	0.09	0.13	
Al <sub>2</sub> O <sub>3</sub>	20.10	19.54	19.99	20.05	19.81	20.34	20.25	19.98	20.16	19.53	19.67	19.89	20.06	19.77	19.99	20.19	20.03	20.05	20.09	19.88	
FeO*	29.07	29.38	29.86	30.11	30.58	29.21	29.03	28.90	27.55	21.22	29.05	28.27	29.88	29.80	31.89	29.92	30.17	28.28	28.75	29.40	
MnO	1.89	1.50	1.30	1.33	1.31	3.87	3.89	3.99	4.78	10.40	3.77	4.52	2.32	1.57	1.24	1.78	1.63	1.95	1.56	1.67	
MgO	1.59	1.64	1.54	1.66	1.47	1.13	1.32	1.33	1.17	1.14	1.13	1.15	1.56	1.48	1.35	1.52	1.65	1.64	1.65	1.34	
CaO	9.60	9.34	9.18	8.54	8.36	8.20	7.79	7.76	8.16	9.46	7.96	7.70	7.98	8.80	8.48	8.42	8.49	9.11	9.38	8.91	
Total	99.80	98.50	99.52	99.24	98.62	100.33	99.43	99.30	99.15	99.05	98.82	98.58	99.54	98.62	100.29	99.26	99.37	98.39	98.89	98.98	
Cation per 12 oxygens																					
Si	3.015	3.023	3.029	3.033	3.024	3.016	3.006	3.031	3.028	3.029	3.033	3.026	3.042	3.026	3.001	3.023	3.016	3.031	3.024	3.049	
Ti	0.005	0.004	0.006	0.002	0.004	0.004	0.006	0.000	0.001	0.004	0.007	0.005	0.002	0.005	0.008	0.005	0.007	0.004	0.006	0.008	
Al	1.906	1.880	1.900	1.910	1.906	1.927	1.936	1.911	1.928	1.873	1.894	1.918	1.907	1.899	1.900	1.925	1.910	1.921	1.917	1.897	
Fe	1.956	2.006	2.014	2.035	2.087	1.964	1.969	1.962	1.870	1.444	1.985	1.934	2.015	2.032	2.151	2.024	2.042	1.922	1.946	1.991	
Mn	0.129	0.104	0.089	0.091	0.090	0.264	0.267	0.275	0.329	0.717	0.261	0.313	0.159	0.108	0.085	0.122	0.112	0.134	0.107	0.114	
Mg	0.190	0.199	0.185	0.200	0.179	0.136	0.160	0.161	0.142	0.139	0.137	0.141	0.187	0.180	0.162	0.183	0.199	0.199	0.199	0.161	
Ca	0.828	0.817	0.793	0.739	0.731	0.706	0.677	0.675	0.710	0.825	0.697	0.675	0.690	0.769	0.733	0.729	0.736	0.793	0.813	0.773	
Total	8.027	8.033	8.015	8.010	8.021	8.016	8.020	8.014	8.007	8.031	8.013	8.011	8.002	8.019	8.041	8.010	8.022	8.004	8.012	7.994	
*Total Fe as FeO																					
Lithology																					
Sample																					
		eclogite																		SN106B	
No.	39	52	55	1	3	5	7	1	4	6	7	4	7	9	11	14	26	27	29	30	
SiO <sub>2</sub>	37.44	37.53	37.91	37.50	37.62	37.27	37.49	37.39	37.47	37.46	37.52	37.98	37.86	37.73	37.51	37.91	37.74	37.36	38.07	37.91	
TiO <sub>2</sub>	0.09	0.04	0.04	0.14	0.03	0.06	0.00	0.07	0.06	0.05	0.06	0.13	0.06	0.09	0.07	0.09	0.06	0.12	0.00	0.04	
Al <sub>2</sub> O <sub>3</sub>	19.92	20.69	20.42	19.91	20.12	19.92	19.98	20.18	20.28	20.23	20.10	19.93	20.25	20.07	20.13	20.34	20.38	19.12	20.46	20.56	
FeO*	29.17	28.73	28.52	26.35	27.71	26.87	27.42	28.83	27.88	29.16	28.69	28.22	29.37	28.90	30.61	29.96	29.54	27.85	28.91	29.35	
MnO	2.70	1.65	1.59	3.17	2.53	3.14	3.33	2.19	2.56	2.01	2.11	2.39	1.51	2.03	1.64	2.41	1.68	4.61	0.93	1.37	
MgO	1.17	1.75	1.69	1.68	1.80	1.96	1.74	1.69	1.50	1.65	1.69	1.98	2.50	2.24	2.52	2.26	2.33	1.97	2.27	2.55	
CaO	8.36	9.49	9.55	9.76	9.49	9.28	9.47	9.40	9.53	9.00	8.63	8.98	8.38	8.62	7.19	7.32	8.61	9.31	9.41	8.62	
Total	98.85	99.86	99.71	98.50	99.30	98.50	99.43	99.75	98.28	99.55	98.80	99.60	99.94	99.67	99.67	100.28	100.34	100.33	100.05	100.39	
Cation per 12 oxygens																					
Si	3.044	3.005	3.034	3.039	3.029	3.025	3.023	3.009	3.022	3.018	3.038	3.047	3.025	3.027	3.018	3.028	3.010	3.013	3.030	3.013	
Ti	0.006	0.002	0.002	0.008	0.002	0.004	0.000	0.004	0.004	0.003	0.004	0.008	0.004	0.005	0.004	0.005	0.004	0.007	0.000	0.002	
Al	1.908	1.952	1.927	1.902	1.910	1.905	1.899	1.914	1.927	1.921	1.918	1.884	1.907	1.898	1.908	1.915	1.916	1.817	1.920	1.926	
Fe	1.983	1.924	1.909	1.786	1.866	1.824	1.849	1.940	1.880	1.965	1.942	1.894	1.963	1.940	2.060	2.011	1.971	1.878	1.925	1.951	
Mn	0.186	0.112	0.107	0.217	0.173	0.216	0.228	0.149	0.175	0.137	0.145	0.162	0.102	0.138	0.112	0.163	0.113	0.315	0.063	0.092	
Mg	0.142	0.209	0.202	0.203	0.216	0.238	0.209	0.203	0.180	0.198	0.203	0.236	0.298	0.268	0.302	0.269	0.277	0.237	0.269	0.302	
Ca	0.728	0.814	0.819	0.848	0.819	0.807	0.818	0.811	0.823	0.777	0.749	0.772	0.718	0.741	0.620	0.627	0.736	0.805	0.803	0.734	
Total	7.996	8.017	8.000	8.002	8.014	8.019	8.027	8.030	8.011	8.019	7.999	8.003	8.017	8.018	8.024	8.009	8.028	8.071	8.010	8.021	
*Total Fe as FeO																					
Lithology																					
Sample																					
No.	38	39	41	64	65	67	68	70	77	78	2	3	5	7	9	11	13	15			



Table 1. (Continued)

Lithology																							
Sample																							
No.	rim in O	rim in O	←	core in O	→	rim in O	rim in O	rim in O	rim in O	core in O	rim in O	rim in O	core in O	rim in O	rim in O	core in O	rim in O	rim in O	←	core in O	→	rim in O	
	21	24	25	26	27	28	31	33	48	49	53	56	57	58	61	62	63	66	67	68			
SiO <sub>2</sub>	37.80	37.20	37.41	37.62	37.25	37.42	37.40	37.38	37.47	37.75	37.86	38.03	37.86	37.66	37.67	37.68	37.54	37.30	37.60	37.68			
TiO <sub>2</sub>	0.08	0.02	0.07	0.17	0.07	0.06	0.03	0.00	0.11	0.04	0.02	0.03	0.08	0.05	0.00	0.24	0.01	0.09	0.12	0.09			
Al <sub>2</sub> O <sub>3</sub>	20.02	19.88	19.43	19.29	19.68	20.30	19.75	20.10	20.05	20.24	20.08	20.73	20.10	20.22	20.11	19.72	20.39	19.98	19.88	20.39			
FeO*	29.08	30.21	29.30	29.58	29.15	29.82	29.32	29.15	28.15	28.99	29.28	29.19	28.25	30.42	29.04	28.67	29.53	29.43	28.96	29.67			
MnO	1.85	0.67	2.03	2.35	1.97	1.00	1.05	1.73	2.25	1.55	1.55	0.68	1.82	1.58	1.43	1.90	1.69	1.20	3.12	1.13			
MgO	2.34	2.56	2.32	2.44	2.29	2.73	2.62	2.29	2.21	2.42	2.36	2.37	2.32	2.48	2.46	2.28	2.33	2.41	1.67	2.49			
CaO	8.67	8.11	8.68	8.18	8.55	7.94	8.28	9.00	9.01	8.41	8.50	9.32	9.15	7.90	8.59	9.19	8.53	8.55	8.81	8.03			
Total	99.84	98.64	99.24	99.62	98.96	99.27	98.44	99.65	99.23	99.39	99.65	100.35	99.57	100.32	99.30	99.68	100.01	98.96	100.15	99.47			
Cation per 12 oxygens																							
Si	3.029	3.018	3.028	3.035	3.020	3.010	3.033	3.007	3.019	3.030	3.035	3.017	3.033	3.011	3.028	3.026	3.006	3.015	3.022	3.022			
Ti	0.005	0.001	0.005	0.010	0.004	0.003	0.002	0.000	0.006	0.002	0.001	0.002	0.005	0.003	0.000	0.015	0.001	0.005	0.007	0.005			
Al	1.890	1.901	1.853	1.834	1.881	1.924	1.888	1.906	1.904	1.915	1.897	1.938	1.897	1.905	1.906	1.866	1.924	1.904	1.883	1.927			
Fe	1.949	2.050	1.983	1.996	1.976	2.006	1.989	1.961	1.897	1.946	1.963	1.937	1.893	2.034	1.953	1.926	1.977	1.989	1.946	1.990			
Mn	0.126	0.046	0.139	0.161	0.135	0.068	0.072	0.118	0.154	0.106	0.105	0.046	0.123	0.107	0.097	0.129	0.115	0.082	0.212	0.077			
Mg	0.279	0.310	0.279	0.293	0.276	0.327	0.317	0.275	0.265	0.289	0.283	0.281	0.277	0.296	0.295	0.273	0.278	0.291	0.200	0.298			
Ca	0.744	0.705	0.753	0.707	0.743	0.684	0.720	0.775	0.777	0.723	0.730	0.792	0.785	0.677	0.740	0.791	0.732	0.741	0.758	0.690			
Total	8.021	8.031	8.041	8.037	8.035	8.024	8.021	8.040	8.023	8.010	8.015	8.012	8.013	8.033	8.019	8.026	8.032	8.027	8.029	8.009			
*Total Fe as FeO																							
Lithology																							
eclogite																							
Sample																							
No.	rim in O	core in O	core in O	→rim in O	rim	1	2	3	←	4	5	6	8	9	10	11	12	13	14	15	16	rim	rim
	71	72	77	78																			
SiO <sub>2</sub>	37.83	37.81	37.56	37.61	37.49	37.28	37.53	37.36	37.43	37.66	37.19	37.59	37.56	37.29	37.27	37.33	37.56	37.75	37.57	37.36			
TiO <sub>2</sub>	0.06	0.65	0.07	0.03	0.01	0.03	0.03	0.16	0.17	0.08	0.29	0.16	0.15	0.11	0.08	0.08	0.06	0.04	0.04	0.00			
Al <sub>2</sub> O <sub>3</sub>	20.28	19.84	19.95	20.05	21.11	21.30	20.80	20.67	20.73	20.92	20.68	20.74	20.70	20.92	21.05	20.96	21.22	21.34	21.33	21.10			
FeO*	28.92	28.44	29.27	29.53	25.20	26.44	28.03	28.89	27.10	25.54	24.78	25.76	26.93	27.82	28.41	28.91	27.19	25.82	25.04	24.81			
MnO	1.84	2.27	1.83	0.91	1.37	0.44	0.38	0.50	1.36	1.55	2.38	2.04	1.30	0.98	0.71	0.60	0.47	1.31	1.83	1.72			
MgO	2.31	1.90	2.43	2.66	3.14	3.24	2.73	2.29	2.77	2.83	2.01	2.40	2.85	2.77	2.37	2.30	2.69	3.19	2.84	2.82			
CaO	8.99	8.46	8.70	8.74	10.35	10.31	9.98	9.70	9.84	10.32	11.74	10.74	9.66	9.19	9.83	9.62	10.30	10.32	10.76	10.65			
Total	100.22	99.37	99.80	99.53	98.66	99.04	99.48	99.56	99.40	98.89	99.07	99.42	99.15	99.07	99.73	99.80	99.47	99.77	99.41	98.46			
Cation per 12 oxygens																							
Si	3.018	3.039	3.016	3.019	2.993	2.970	2.994	2.991	2.989	3.006	2.981	2.999	3.001	2.987	2.975	2.981	2.987	2.984	2.983	2.992			
Ti	0.004	0.039	0.004	0.002	0.000	0.002	0.002	0.009	0.010	0.005	0.017	0.009	0.009	0.006	0.005	0.005	0.003	0.003	0.003	0.000			
Al	1.907	1.880	1.888	1.897	1.986	2.000	1.956	1.950	1.951	1.968	1.954	1.950	1.950	1.975	1.981	1.973	1.989	1.988	1.995	1.991			
Fe	1.930	1.912	1.966	1.982	1.682	1.762	1.870	1.935	1.810	1.705	1.662	1.718	1.800	1.864	1.896	1.931	1.808	1.707	1.662	1.662			
Mn	0.124	0.155	0.124	0.062	0.093	0.030	0.026	0.034	0.092	0.105	0.161	0.138	0.088	0.066	0.048	0.041	0.031	0.088	0.123	0.116			
Mg	0.275	0.228	0.290	0.318	0.374	0.384	0.325	0.273	0.330	0.336	0.240	0.285	0.340	0.331	0.282	0.274	0.319	0.376	0.335	0.337			
Ca	0.768	0.728	0.748	0.751	0.885	0.880	0.853	0.832	0.842	0.882	1.009	0.918	0.827	0.789	0.841	0.823	0.877	0.874	0.915	0.914			
Total	8.025	7.981	8.036	8.031	8.013	8.028	8.026	8.024	8.025	8.006	8.025	8.017	8.015	8.019	8.029	8.028	8.015	8.019	8.017	8.012			
*Total Fe as FeO																							
Lithology																							
Sample																							
No.	18																						
SiO <sub>2</sub>	37.19																						
TiO <sub>2</sub>	0.19																						
Al <sub>2</sub> O <sub>3</sub>	20.83																						
FeO*	26.55																						
MnO	2.41																						
MgO	1.57																						
CaO	10.96																						
Total	99.70																						
Cation per 12 oxygens																							
Si	2.979																						
Ti	0.011																						
Al	1.966																						
Fe	1.779																						
Mn	0.164																						
Mg	0.187																						
Ca	0.941																						
Total	8.027																						
*Total Fe as FeO																							

rim in O : rim of inclusion in omphacite ; core in O : core of inclusion in omphacite

Chemical compositions of the constituent minerals of the Gazo mass, a tectonic block  
in the Sambagawa metamorphic belt, Besshi district, central Shikoku, Japan

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Table 2. Chemical compositions of clinopyroxenes

Lithology Sample	eclogite																			
	SN24									SN30										
No.	15	16	17	18	sym 19	sym 30	34	65	rim 67	68	69	sym 70	71	22	in G 14	in G 15	in G 18	in G 20	in G 25	in G 27
SiO <sub>2</sub>	55.01	54.16	55.10	55.20	53.02	52.67	54.92	54.88	55.11	54.75	54.53	53.38	55.17	55.10	53.49	53.56	53.63	54.02	54.15	54.24
TiO <sub>2</sub>	0.12	0.08	0.11	0.11	0.03	0.06	0.11	0.07	0.04	0.08	0.11	0.00	0.09	0.12	0.04	0.05	0.03	0.04	0.04	0.01
Al <sub>2</sub> O <sub>3</sub>	9.47	9.39	9.15	9.44	4.48	3.21	9.75	9.54	9.91	9.50	9.35	3.73	9.42	9.07	4.52	5.39	4.06	4.86	3.73	4.52
FeO*	8.57	9.08	9.36	9.00	11.12	11.04	8.87	9.38	6.79	8.80	9.15	10.67	8.73	9.21	14.66	14.13	14.60	14.15	13.61	13.74
MnO	0.06	0.07	0.13	0.14	0.23	0.22	0.02	0.07	0.09	0.13	0.11	0.24	0.13	0.14	0.28	0.04	0.29	0.23	0.33	0.17
MgO	6.62	6.73	6.63	6.37	9.02	9.26	6.48	6.28	7.39	6.72	6.62	9.54	6.78	7.09	6.60	6.39	7.00	6.69	7.84	7.11
CaO	12.39	12.45	12.35	11.96	18.26	19.41	12.30	12.04	13.50	12.32	12.09	18.87	12.37	12.52	11.92	12.74	12.03	11.87	13.63	12.58
Na <sub>2</sub> O	7.67	7.77	7.57	7.66	4.04	3.09	7.55	7.93	7.39	7.78	7.88	3.57	7.63	7.39	7.46	7.32	7.83	7.52	6.34	7.28
K <sub>2</sub> O	0.04	0.04	0.05	0.03	0.01	0.02	0.04	0.02	0.03	0.04	0.04	0.04	0.04	0.03	0.03	0.02	0.04	0.02	0.04	0.04
Cr <sub>2</sub> O <sub>3</sub>	0.00	0.05	0.04	0.00	0.00	0.00	0.01	0.02	0.03	0.02	0.03	0.00	0.02	0.02	0.00	0.00	0.00	0.04	0.02	0.05
Total	99.94	99.81	100.48	99.89	100.18	98.97	100.05	100.22	100.27	100.14	99.90	100.03	100.38	100.68	99.00	99.64	99.51	99.44	99.74	99.74
Cation per 6 oxygens																				
Si	2.003	1.985	2.003	2.012	1.983	1.999	1.999	2.000	1.989	1.995	1.995	1.997	2.002	1.998	2.039	2.023	2.038	2.042	2.042	2.042
Ti	0.003	0.002	0.003	0.003	0.001	0.002	0.003	0.002	0.001	0.002	0.003	0.000	0.002	0.003	0.001	0.002	0.001	0.001	0.001	0.000
Al	0.406	0.406	0.392	0.405	0.197	0.143	0.418	0.410	0.422	0.408	0.403	0.164	0.403	0.388	0.203	0.240	0.182	0.217	0.166	0.201
Fe	0.261	0.279	0.285	0.274	0.348	0.350	0.270	0.286	0.205	0.268	0.280	0.334	0.265	0.279	0.467	0.446	0.464	0.447	0.429	0.433
Mn	0.002	0.002	0.004	0.004	0.007	0.007	0.001	0.002	0.003	0.004	0.003	0.008	0.004	0.004	0.009	0.001	0.009	0.007	0.011	0.005
Mg	0.359	0.368	0.360	0.346	0.503	0.524	0.351	0.341	0.398	0.365	0.361	0.532	0.367	0.383	0.375	0.360	0.397	0.377	0.441	0.399
Ca	0.483	0.489	0.481	0.467	0.732	0.789	0.480	0.470	0.522	0.481	0.474	0.756	0.481	0.487	0.487	0.515	0.490	0.481	0.551	0.507
Na	0.541	0.552	0.534	0.541	0.293	0.227	0.532	0.561	0.517	0.549	0.559	0.259	0.537	0.520	0.551	0.536	0.577	0.551	0.463	0.532
K	0.002	0.002	0.002	0.001	0.000	0.001	0.002	0.001	0.001	0.002	0.002	0.002	0.002	0.001	0.001	0.001	0.002	0.001	0.002	0.002
Cr	0.000	0.001	0.001	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.001	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.001	0.002
Total	4.062	4.086	4.065	4.054	4.064	4.042	4.056	4.073	4.058	4.075	4.080	4.051	4.063	4.065	4.134	4.124	4.160	4.124	4.106	4.123

\*Total Fe as FeO

Lithology Sample	eclogite																			
	SN24									SN30										
No.	in G 29	in G 30	rim 35	core 36	→ rim 37	rim 39	rim 41	41	54	55	← 56	57	→ 58	rim 59	61	core 63	rim 64	65	66	67
SiO <sub>2</sub>	53.51	54.35	53.15	54.11	53.11	53.29	53.56	54.89	53.46	53.22	53.52	53.78	53.79	53.29	53.68	54.60	54.02	53.45	54.06	53.93
TiO <sub>2</sub>	0.04	0.04	0.13	0.02	0.10	0.02	0.12	0.09	0.12	0.16	0.05	0.02	0.06	0.08	0.03	0.00	0.13	0.07	0.06	0.00
Al <sub>2</sub> O <sub>3</sub>	4.78	4.57	6.12	4.29	6.13	4.94	6.59	8.59	7.29	7.61	4.79	4.68	6.07	7.11	4.91	5.52	7.69	6.73	6.29	4.24
FeO*	15.06	13.41	14.09	13.22	14.14	14.63	14.00	9.55	12.96	12.48	12.93	13.14	13.08	12.56	12.54	13.06	12.39	12.54	11.88	13.55
MnO	0.12	0.29	0.07	0.22	0.08	0.04	0.04	0.13	0.07	0.15	0.20	0.35	0.12	0.09	0.19	0.20	0.04	0.05	0.13	0.31
MgO	6.36	7.81	6.04	7.42	5.75	6.32	5.62	7.05	6.01	5.99	7.36	7.34	6.69	6.22	7.54	6.62	5.95	6.45	6.80	7.49
CaO	12.38	12.54	12.61	12.71	12.69	13.05	12.27	12.30	12.25	12.02	12.57	12.28	12.32	12.40	12.63	11.58	11.80	12.55	11.74	12.14
Na <sub>2</sub> O	7.13	7.35	7.31	7.16	7.10	6.92	7.23	7.71	6.80	6.86	6.52	6.81	6.65	6.51	6.26	7.24	6.92	6.24	6.93	6.75
K <sub>2</sub> O	0.05	0.04	0.04	0.04	0.02	0.06	0.04	0.06	0.05	0.04	0.03	0.04	0.04	0.06	0.02	0.05	0.03	0.06	0.03	0.01
Cr <sub>2</sub> O <sub>3</sub>	0.03	0.00	0.01	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.07	0.01	0.04	0.02	0.03	0.04	0.04	0.00
Total	99.45	100.40	99.57	99.19	99.14	99.27	99.48	100.38	99.00	98.52	97.98	98.47	98.88	98.32	97.84	98.89	98.99	98.17	97.95	98.40
Cation per 6 oxygens																				
Si	2.033	2.031	2.008	2.045	2.014	2.027	2.018	2.003	2.010	2.006	2.041	2.043	2.028	2.014	2.043	2.055	2.020	2.022	2.042	2.052
Ti	0.001	0.001	0.004	0.001	0.003	0.001	0.003	0.002	0.003	0.004	0.002	0.001	0.002	0.002	0.001	0.000	0.004	0.002	0.002	0.000
Al	0.214	0.201	0.273	0.191	0.274	0.221	0.292	0.370	0.323	0.338	0.215	0.210	0.270	0.317	0.220	0.245	0.339	0.300	0.280	0.190
Fe	0.478	0.419	0.445	0.418	0.449	0.465	0.441	0.292	0.407	0.393	0.412	0.418	0.412	0.397	0.399	0.411	0.387	0.397	0.375	0.431
Mn	0.004	0.009	0.002	0.007	0.002	0.001	0.001	0.004	0.002	0.005	0.006	0.011	0.004	0.003	0.006	0.006	0.001	0.001	0.004	0.010
Mg	0.360	0.435	0.340	0.418	0.325	0.358	0.316	0.384	0.337	0.337	0.418	0.416	0.376	0.350	0.428	0.371	0.331	0.364	0.383	0.425
Ca	0.504	0.502	0.511	0.515	0.516	0.532	0.495	0.481	0.494	0.485	0.514	0.500	0.497	0.502	0.515	0.467	0.473	0.509	0.475	0.495
Na	0.525	0.533	0.535	0.525	0.522	0.510	0.528	0.546	0.495	0.502	0.482	0.502	0.486	0.477	0.462	0.529	0.502	0.458	0.507	0.498
K	0.002	0.002	0.002	0.002	0.001	0.003	0.002	0.003	0.002	0.002	0.002	0.002	0.002	0.003	0.001	0.002	0.001	0.003	0.001	0.000
Cr	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.002	0.000	0.001	0.001	0.001	0.001	0.001	0.000
Total	4.122	4.134	4.120	4.122	4.107	4.118	4.098	4.084	4.074	4.072	4.092	4.102	4.078	4.065	4.077	4.088	4.059	4.056	4.070	4.102

\*Total Fe as FeO

Lithology Sample	eclogite																			
	SN24									SN30										
No.	rim 68	69	in E 80	in A 90	in A 91	in A 92	in A 93	in G 120	in G 121	in G 123	in G 124	in G 125	in G 126	in G 127	in G 132	in G 134	in G 135	in G 138	in G 139	in G 142
SiO <sub>2</sub>	54.74	54.60	54.45	54.14	54.18	55.17	54.02	54.24	55.10	55.04	53.53	54.44	54.56	55.37	54.97	54.15	54.57	54.56	54.54	54.44
TiO <sub>2</sub>	0.10	0.06	0.05	0.15	0.03	0.03	0.11	0.06	0.06	0.02	0.07	0.04	0.00	0.04	0.09	0.04	0.04	0.00	0.06	0.04
Al <sub>2</sub> O <sub>3</sub>	7.56	7.53	6.21	6.59	5.66	5.03	6.40	5.87	4.53	4.56	4.14	5.00	4.80	5.18	5.16	4.48	4.64	4.99	4.48	4.42
FeO*	12.00	12.17	12.37	14.32	14.88	11.96	13.55	15.84	13.70	13.10	15.12	14.07	14.90	12.96	14.00	14.37	13.42	14.37	14.04	15.34
MnO	0.11	0.13	0.14	0.05	0.10	0.28	0.11	0.08	0.42	0.26	0.07	0.11	0.21	0.30	0.25	0.15	0.23	0.22	0.25	0.28
MgO	5.78	5.87	7.04	5.71	5.64	7.90	5.91	5.08	7.44	7.58	6.50	6.68	6.36	7.28	6.51	6.79	7.52	6.51	7.17	6.28
CaO	11.25	11.60	12.16	11.92	11.50	12.26	12.48	10.65	11.37	12.56	13.18	12.57	11.51	11.33	11.77	12.83	12.61	11.46	12.83	11.09
Na <sub>2</sub> O	7.43	7.27	6.98	7.09	7.07	7.05	6.76	7.89	7.58	6.75	6.15	6.67	7.18	7.67	7.10	6.42	6.95	7.41	6.83	7.52
K <sub>2</sub> O	0.06	0.02	0.03	0.06	0.03	0.07	0.04	0.04	0.04	0.04	0.02	0.07	0.03	0.06	0.03	0.05	0.02	0.03	0.03	0.03
Cr <sub>2</sub> O <sub>3&lt;/</sub>																				

Table 2. (Continued)

Lithology																				
Sample																				
No.	rim in G	rim in G	rim in G	rim in G	rim in G	rim in G	rim in G	rim in G	rim in G	rim in G	rim						rim	rim	rim	rim
	4	5	12	13	15	19	25	28	32	33	41	42	43	44	45	49	50	53	54	2
SiO2	53.63	53.85	53.80	54.13	54.15	54.19	54.13	53.43	53.89	53.50	54.03	53.83	53.43	54.06	54.46	53.14	53.14	54.25	55.01	53.73
TiO2	0.01	0.02	0.03	0.04	0.03	0.07	0.03	0.00	0.03	0.01	0.09	0.13	0.12	0.02	0.03	0.03	0.11	0.11	0.08	0.06
Al2O3	4.59	4.61	3.89	4.90	4.93	5.12	4.90	4.85	4.65	4.35	7.06	6.96	6.37	4.67	4.40	5.33	6.95	7.18	6.11	6.07
FeO*	14.09	14.47	12.53	13.17	13.35	14.19	14.44	13.89	14.13	14.98	13.68	13.15	13.97	14.31	13.15	15.42	13.49	13.80	12.49	12.98
MnO	0.34	0.35	0.22	0.22	0.21	0.26	0.26	0.12	0.19	0.08	0.08	0.09	0.04	0.14	0.26	0.08	0.07	0.07	0.33	0.14
MgO	6.88	6.49	8.39	7.53	7.09	6.54	6.11	6.68	6.40	6.52	5.23	5.45	5.74	6.26	7.51	5.16	5.45	5.57	6.76	6.08
CaO	11.64	11.19	13.81	12.30	12.29	10.81	10.63	12.02	11.72	12.41	10.79	11.61	12.16	12.10	12.17	11.22	11.62	11.61	10.60	12.39
Na2O	7.75	7.91	6.06	7.27	7.06	7.77	8.03	7.00	7.22	7.22	8.03	7.48	6.87	7.41	7.35	7.80	7.55	7.74	8.28	7.04
K2O	0.05	0.03	0.02	0.04	0.03	0.05	0.04	0.05	0.06	0.03	0.04	0.05	0.02	0.04	0.05	0.04	0.05	0.00	0.02	0.03
Cr2O3	0.01	0.01	0.00	0.00	0.00	0.01	0.04	0.03	0.00	0.02	0.04	0.03	0.05	0.00	0.00	0.02	0.02	0.02	0.01	0.05
Total	98.98	98.94	98.75	99.61	99.12	99.00	98.59	98.07	98.28	99.10	99.05	98.79	98.78	99.00	99.38	98.23	98.43	100.35	99.69	98.58
Cation per 6 oxygens																				
Si	2.040	2.050	2.038	2.034	2.044	2.051	2.061	2.044	2.057	2.040	2.034	2.030	2.025	2.053	2.050	2.044	2.018	2.019	2.048	2.034
Ti	0.000	0.001	0.001	0.001	0.001	0.002	0.001	0.000	0.001	0.000	0.002	0.004	0.004	0.000	0.001	0.001	0.003	0.003	0.002	0.002
Al	0.206	0.207	0.174	0.217	0.219	0.228	0.220	0.218	0.209	0.195	0.313	0.310	0.284	0.209	0.195	0.241	0.311	0.315	0.268	0.271
Fe	0.448	0.461	0.397	0.414	0.421	0.449	0.460	0.445	0.451	0.478	0.431	0.415	0.443	0.455	0.414	0.496	0.428	0.430	0.389	0.411
Mn	0.011	0.011	0.007	0.007	0.007	0.008	0.008	0.004	0.006	0.003	0.003	0.001	0.005	0.008	0.002	0.002	0.002	0.001	0.011	0.004
Mg	0.390	0.368	0.474	0.422	0.399	0.369	0.347	0.381	0.364	0.371	0.294	0.306	0.324	0.354	0.422	0.296	0.308	0.309	0.375	0.343
Ca	0.474	0.456	0.561	0.495	0.497	0.438	0.433	0.493	0.479	0.507	0.435	0.469	0.494	0.492	0.491	0.462	0.473	0.463	0.423	0.503
Na	0.572	0.584	0.445	0.530	0.516	0.570	0.593	0.520	0.534	0.534	0.586	0.547	0.505	0.545	0.537	0.582	0.556	0.559	0.598	0.517
K	0.002	0.002	0.001	0.002	0.001	0.002	0.002	0.002	0.003	0.001	0.002	0.003	0.001	0.002	0.003	0.002	0.002	0.000	0.001	0.002
Cr	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.001	0.001	0.000	0.002
Total	4.144	4.139	4.097	4.122	4.105	4.119	4.125	4.107	4.106	4.129	4.100	4.086	4.082	4.116	4.121	4.126	4.102	4.100	4.115	4.087

\*Total Fe as FeO

Lithology																				
Sample																				
No.	rim	rim	rim	rim	rim	rim	rim	rim	rim	rim	rim	rim	rim	rim	rim	rim	rim	rim	rim	core
	4	6	8	2	3	5	8	1	2	3	4	5	6	7	8	9	10	11	12	13
SiO2	53.80	53.41	53.97	54.05	53.57	54.27	53.82	52.91	53.25	53.29	53.30	53.43	53.54	53.37	53.81	53.88	53.37	53.33	53.22	53.00
TiO2	0.10	0.09	0.09	0.03	0.10	0.05	0.03	0.07	0.09	0.09	0.11	0.04	0.00	0.00	0.01	0.01	0.02	0.03	0.14	0.01
Al2O3	7.04	6.54	7.40	5.48	7.27	5.56	6.99	6.22	6.90	6.51	6.37	5.11	4.87	4.61	4.75	5.08	4.26	4.50	4.23	5.58
FeO*	12.63	13.27	12.36	12.78	13.16	13.21	14.00	14.77	14.02	14.33	14.12	15.37	14.55	13.62	12.50	14.25	14.09	14.79	14.45	16.05
MnO	0.11	0.15	0.12	0.23	0.14	0.20	0.12	0.07	0.06	0.06	0.02	0.08	0.10	0.27	0.20	0.08	0.18	0.07	0.11	0.03
MgO	6.06	5.93	5.64	6.88	5.41	6.72	4.80	5.36	5.51	5.68	5.88	5.74	6.47	7.13	7.77	6.85	7.26	6.86	7.08	5.00
CaO	12.33	12.06	11.66	11.66	11.46	11.66	10.60	10.98	11.14	11.91	12.06	11.38	11.92	11.89	12.22	11.58	13.18	12.59	12.99	11.38
Na2O	6.99	7.16	7.29	7.43	7.41	7.43	8.00	7.63	7.82	7.27	7.21	7.50	7.25	7.52	7.31	7.53	6.63	6.80	6.63	7.80
K2O	0.02	0.06	0.05	0.04	0.05	0.02	0.04	0.04	0.05	0.04	0.05	0.03	0.03	0.03	0.03	0.05	0.02	0.02	0.04	0.03
Cr2O3	0.01	0.01	0.04	0.07	0.03	0.10	0.02	0.03	0.04	0.00	0.02	0.01	0.00	0.05	0.04	0.00	0.01	0.00	0.00	0.04
Total	99.09	98.68	98.63	98.65	98.60	99.21	98.43	98.06	98.87	99.19	99.12	98.68	98.74	98.49	98.63	99.30	99.00	98.99	98.88	98.91
Cation per 6 oxygens																				
Si	2.019	2.022	2.028	2.043	2.023	2.042	2.042	2.028	2.017	2.016	2.017	2.043	2.041	2.037	2.037	2.037	2.032	2.033	2.031	2.031
Ti	0.003	0.003	0.002	0.001	0.003	0.001	0.001	0.002	0.003	0.003	0.003	0.001	0.000	0.000	0.000	0.000	0.000	0.001	0.004	0.000
Al	0.311	0.292	0.328	0.244	0.324	0.246	0.313	0.281	0.308	0.290	0.284	0.230	0.219	0.207	0.212	0.226	0.191	0.202	0.190	0.252
Fe	0.396	0.420	0.389	0.404	0.416	0.416	0.444	0.473	0.444	0.454	0.447	0.491	0.464	0.435	0.396	0.450	0.449	0.471	0.461	0.514
Mn	0.004	0.005	0.004	0.007	0.005	0.006	0.004	0.002	0.002	0.002	0.001	0.003	0.003	0.009	0.006	0.003	0.006	0.002	0.003	0.001
Mg	0.339	0.334	0.316	0.387	0.305	0.377	0.271	0.306	0.311	0.320	0.331	0.327	0.368	0.405	0.439	0.386	0.412	0.390	0.402	0.285
Ca	0.496	0.489	0.470	0.472	0.464	0.470	0.431	0.451	0.452	0.483	0.489	0.466	0.487	0.486	0.496	0.469	0.538	0.514	0.531	0.467
Na	0.508	0.526	0.531	0.544	0.542	0.542	0.588	0.567	0.574	0.533	0.529	0.556	0.536	0.537	0.552	0.489	0.502	0.490	0.579	
K	0.001	0.003	0.002	0.002	0.002	0.001	0.002	0.002	0.002	0.002	0.003	0.001	0.002	0.002	0.001	0.002	0.001	0.001	0.002	0.002
Cr	0.000	0.000	0.001	0.002	0.001	0.003	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.000	0.000	0.001
Total	4.077	4.094	4.071	4.106	4.084	4.104	4.096	4.113	4.114	4.103	4.104	4.119	4.119	4.138	4.125	4.126	4.117	4.117	4.116	4.133

\*Total Fe as FeO

Lithology																				
Sample																				
	eclogite										SN106B									
No.	rim	rim	rim	rim	rim	rim	rim	rim	rim	rim	rim	rim	rim	rim	rim	rim	rim	rim	rim	core
	14	15	16	17	18	19	20	21	22	23	24	25	22	23	24	25	26	27	27	28
SiO2	53.35	53.06	53.02	52.95	52.89	53.62	53.56	54.25	53.09	53.28	54.03	53.70	54.28	55.55	55.33	55.97	56.08	55.99	55.83	55.83
TiO2	0.10	0.09	0.10	0.09	0.03	0.00	0.03	0.06	0.09	0.08	0.03	0.02	0.02	0.03	0.07	0.07	0.08	0.10	0.07	0.07
Al2O3	6.80	6.94	6.59	6.16	4.59	4.43	4.58	5.14	6.98	6.13	5.48	4.97	6.28	7.08	9.33	9.95	10.05	10.42	10.31	10.04
FeO*	13.67	14.09	14.02	14.39	16.02	14.63	14.22	11.93	13.78	14.65	12.44	14								

Table 2. (Continued)

Lithology																					
Sample																					
No.	rim																				
	→ 29	30	31	32	32	33	34	35	36	37	38	39	← 40	→ 41	42	rim 43	rim 44	45	← 46	47	
SiO2	56.00	56.12	55.21	55.70	54.50	54.16	54.56	54.16	54.34	54.74	55.57	55.19	55.36	55.59	55.61	55.33	55.14	54.89	53.51	53.10	
TiO2	0.09	0.06	0.09	0.08	0.07	0.06	0.07	0.06	0.06	0.04	0.09	0.05	0.10	0.08	0.09	0.12	0.08	0.09	0.03	0.10	
Al2O3	9.99	10.29	8.65	10.29	5.71	5.51	5.45	5.09	5.55	6.62	9.03	9.15	10.28	10.02	9.78	9.33	9.85	9.68	6.17	5.94	
FeO*	7.63	7.64	8.10	7.43	11.98	11.64	11.98	12.09	11.64	11.44	8.38	8.02	7.67	8.10	8.02	7.94	7.79	7.66	11.69	11.89	
MnO	0.02	0.03	0.00	0.02	0.00	0.00	0.00	0.00	0.02	0.01	0.00	0.05	0.00	0.00	0.06	0.00	0.06	0.02	0.02	0.11	
MgO	6.59	6.38	7.33	6.48	7.09	7.62	7.48	7.69	7.55	6.96	7.19	7.17	6.69	6.73	6.85	6.91	6.59	6.64	6.94	7.43	
CaO	11.59	11.23	12.97	11.51	13.06	13.45	13.07	13.32	13.04	12.28	12.60	12.56	11.56	11.55	12.04	12.13	11.62	11.78	12.14	12.96	
Na2O	7.71	7.94	6.78	7.69	6.52	6.24	6.73	6.42	6.52	7.13	7.03	7.29	7.58	7.50	7.40	7.38	7.58	7.31	7.05	6.12	
K2O	0.01	0.03	0.05	0.01	0.05	0.01	0.04	0.05	0.05	0.07	0.03	0.02	0.06	0.04	0.06	0.07	0.03	0.04	0.06	0.06	
Cr2O3	0.03	0.00	0.08	0.03	0.03	0.00	0.01	0.03	0.04	0.01	0.05	0.00	0.01	0.01	0.04	0.03	0.06	0.02	0.00	0.03	
Total	99.65	99.71	99.25	99.22	99.01	98.70	99.36	98.91	98.81	99.29	99.97	99.50	99.31	99.61	99.94	99.23	98.78	98.14	97.61	97.74	
Cation per 6 oxygens																					
Si	2.025	2.026	2.018	2.020	2.041	2.034	2.039	2.037	2.038	2.036	2.016	2.012	2.010	2.015	2.013	2.018	2.016	2.019	2.032	2.018	
Ti	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.001	0.002	0.001	0.003	0.002	0.002	0.003	0.002	0.003	0.001	0.003	
Al	0.426	0.438	0.373	0.440	0.252	0.244	0.240	0.225	0.245	0.290	0.386	0.393	0.440	0.428	0.417	0.401	0.425	0.420	0.276	0.266	
Fe	0.231	0.231	0.248	0.225	0.375	0.366	0.374	0.380	0.365	0.356	0.254	0.245	0.233	0.246	0.243	0.242	0.238	0.236	0.371	0.378	
Mn	0.001	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.002	0.000	0.000	0.002	0.000	0.002	0.001	0.001	0.004	
Mg	0.355	0.343	0.399	0.350	0.396	0.427	0.416	0.431	0.422	0.386	0.389	0.390	0.362	0.364	0.370	0.376	0.359	0.364	0.393	0.421	
Ca	0.449	0.434	0.508	0.447	0.524	0.542	0.523	0.537	0.524	0.489	0.490	0.450	0.449	0.467	0.474	0.455	0.464	0.494	0.528		
Na	0.540	0.556	0.480	0.541	0.473	0.454	0.487	0.468	0.474	0.514	0.495	0.515	0.534	0.527	0.519	0.522	0.537	0.521	0.519	0.451	
K	0.001	0.001	0.002	0.001	0.003	0.001	0.002	0.002	0.003	0.003	0.001	0.001	0.003	0.002	0.003	0.003	0.001	0.002	0.003	0.003	
Cr	0.001	0.000	0.002	0.001	0.001	0.000	0.000	0.001	0.001	0.000	0.001	0.000	0.000	0.000	0.001	0.001	0.002	0.001	0.000	0.001	
Total	4.030	4.032	4.033	4.028	4.068	4.069	4.084	4.084	4.075	4.076	4.035	4.048	4.035	4.033	4.037	4.040	4.038	4.030	4.090	4.072	
*Total Fe as FeO																					

Lithology																					
Sample																					
No.	rim																				
	→ 48	49	50	51	1	4	6	8	10	12	14	16	18	20	22	29	30	32	34	35	
SiO2	53.61	54.10	54.09	54.35	55.85	55.62	55.28	55.42	55.54	54.66	54.23	54.36	54.54	54.39	54.56	53.85	54.25	53.90	52.59	55.08	
TiO2	0.07	0.18	0.08	0.09	0.05	0.06	0.08	0.09	0.10	0.06	0.04	0.04	0.07	0.06	0.09	0.05	0.02	0.06	0.00	0.09	
Al2O3	5.68	6.28	5.78	8.86	10.11	7.10	9.66	9.04	9.63	7.02	6.38	6.98	6.28	6.24	7.24	6.92	6.70	6.89	7.28	9.94	
FeO*	11.66	11.27	11.67	7.58	8.22	10.13	7.98	8.46	8.14	9.79	12.23	12.42	12.37	12.24	11.12	11.59	11.93	11.11	13.12	8.04	
MnO	0.00	0.10	0.00	0.06	0.04	0.00	0.08	0.01	0.00	0.03	0.10	0.07	0.07	0.06	0.03	0.05	0.04	0.12	0.29	0.00	
MgO	6.98	6.96	7.27	6.83	6.55	7.13	6.64	6.88	6.98	7.59	7.02	6.33	6.90	6.91	6.81	6.75	6.81	7.17	6.96	6.51	
CaO	12.62	12.35	12.76	12.18	11.79	13.00	12.17	12.52	12.16	13.71	12.77	11.82	12.62	12.72	12.41	12.22	12.22	12.86	12.68	11.78	
Na2O	6.60	6.93	6.62	6.93	7.33	6.77	7.52	7.09	7.41	6.52	6.72	7.31	6.85	6.95	7.01	7.21	7.30	6.60	6.33	7.76	
K2O	0.01	0.02	0.05	0.05	0.01	0.05	0.05	0.03	0.05	0.04	0.01	0.02	0.03	0.06	0.03	0.04	0.04	0.04	0.04	0.03	
Cr2O3	0.00	0.01	0.00	0.04	0.03	0.04	0.00	0.00	0.04	0.00	0.00	0.02	0.01	0.04	0.02	0.01	0.01	0.00	0.02	0.00	
Total	97.22	98.20	98.33	96.95	99.97	99.90	99.45	99.55	100.05	99.41	99.49	99.37	99.75	99.68	99.32	98.69	99.33	98.74	99.31	99.22	
Cation per 6 oxygens																					
Si	2.043	2.036	2.038	2.027	2.017	2.040	2.013	2.020	2.010	2.020	2.024	2.029	2.030	2.028	2.025	2.020	2.025	2.017	1.979	2.010	
Ti	0.002	0.005	0.002	0.002	0.001	0.002	0.002	0.002	0.003	0.002	0.001	0.001	0.002	0.002	0.003	0.001	0.001	0.002	0.000	0.002	
Al	0.255	0.279	0.257	0.389	0.431	0.307	0.414	0.389	0.411	0.306	0.281	0.307	0.276	0.274	0.317	0.306	0.295	0.304	0.323	0.407	
Fe	0.372	0.355	0.368	0.236	0.248	0.311	0.243	0.258	0.247	0.303	0.382	0.388	0.385	0.382	0.345	0.364	0.372	0.348	0.413	0.245	
Mn	0.000	0.003	0.000	0.002	0.001	0.000	0.002	0.000	0.000	0.001	0.003	0.002	0.002	0.002	0.001	0.002	0.001	0.004	0.009	0.000	
Mg	0.397	0.390	0.408	0.379	0.353	0.390	0.361	0.374	0.377	0.418	0.391	0.352	0.383	0.384	0.377	0.378	0.379	0.400	0.390	0.354	
Ca	0.515	0.498	0.515	0.486	0.456	0.511	0.475	0.489	0.472	0.543	0.511	0.473	0.504	0.508	0.494	0.491	0.489	0.516	0.511	0.460	
Na	0.488	0.506	0.484	0.501	0.513	0.482	0.531	0.501	0.520	0.467	0.486	0.429	0.495	0.503	0.504	0.524	0.528	0.479	0.462	0.549	
K	0.000	0.001	0.002	0.002	0.000	0.002	0.002	0.001	0.002	0.002	0.000	0.001	0.001	0.003	0.001	0.002	0.002	0.002	0.002	0.001	
Cr	0.000	0.000	0.000	0.001	0.001	0.001	0.000	0.000	0.001	0.000	0.000	0.001	0.000	0.001	0.001	0.000	0.000	0.000	0.001	0.000	
Total	4.072	4.073	4.074	4.027	4.022	4.046	4.044	4.034	4.042	4.060	4.078	4.082	4.078	4.086	4.067	4.088	4.092	4.070	4.091	4.049	
*Total Fe as FeO																					

Lithology																			eclogite	
Sample																			SN106C	
No.	rim																			
	36	37	38	39	40	50	54	55	59	60	64	65	69	70	74	75	79	1	2	← 3
SiO2	54.98	55.05	54.08	54.17	54.38	54.86	55.18	55.33	55.19	54.18	54.16	53.90	54.04	53.84	54.23	55.22	54.77	54.78	54.78	55.15
TiO2	0.10	0.06	0.06	0.05	0.06	0.06	0.05	0.03	0.12	0.02	0.00	0.05	0.07	0.02	0.09	0.09	0.04	0.12	0.15	0.10
Al2O3	8.63	9.40	5.22	4.91	6.97	8.92	10.01	9.51	10.10	6.28	7.21	7.08	7.02	6.02	5.97	8.99	6.96	8.23	8.70	9.02
FeO*	8.41	8.39	11.80	11.70	11.95	8.34	8.14	8.18	7.97	10.33	10.00	10.75	11.39	12.27	11.92	8.15	11.17	10.06	10.44	10.13
MnO	0.03	0.07	0.00	0.00	0.02	0.08	0.01	0.00	0.01	0.00	0.07	0.07	0.07	0.02	0.07	0.05	0.03	0.08	0.07	0.09
MgO	7.05	6.89	7.58	8.06	6.49	6.98	6.56	6.70	6.47											

Table 2. (Continued)

Lithology																	eclogite					
Sample	core																SN138A					
No.	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	rim	rim	rim	in A	29	31	32
SiO2	54.52	54.11	54.26	54.58	54.60	54.85	54.83	54.52	54.52	54.23	54.22	54.15	54.51	54.47	54.51	54.21	54.18	54.40	55.58	55.73		
TiO2	0.22	0.30	0.06	0.16	0.10	0.12	0.09	0.09	0.02	0.29	0.07	0.11	0.08	0.06	0.08	0.08	0.08	0.08	0.04	0.04		
Al2O3	8.00	7.16	6.85	7.00	6.55	7.78	7.09	7.90	6.79	6.88	7.23	8.12	7.37	8.10	7.91	8.86	8.70	7.80	10.17	10.23		
FeO*	10.35	10.76	10.51	10.82	11.03	10.32	10.89	10.41	10.57	11.29	10.20	10.43	10.29	10.34	10.46	10.19	10.10	10.70	4.77	4.20		
MnO	0.05	0.04	0.03	0.07	0.04	0.06	0.11	0.11	0.04	0.08	0.03	0.09	0.10	0.08	0.10	0.10	0.03	0.02	0.06	0.04		
MgO	5.94	6.48	6.64	6.54	6.56	6.10	6.38	5.96	6.85	6.59	6.44	5.99	6.42	5.93	5.77	5.37	5.42	6.09	8.59	8.97		
CaO	12.26	12.92	13.69	12.91	13.45	12.67	12.81	12.25	13.73	13.25	13.04	12.15	13.12	12.10	12.14	10.83	11.04	12.41	13.75	14.01		
Na2O	7.87	7.41	7.06	7.36	7.03	7.68	7.54	8.03	6.98	7.02	7.08	7.60	7.24	7.80	7.79	8.07	8.28	7.67	6.95	6.90		
K2O	0.03	0.04	0.06	0.06	0.02	0.07	0.05	0.06	0.05	0.05	0.04	0.08	0.06	0.03	0.04	0.09	0.05	0.04	0.04	0.01		
Cr2O3	0.03	0.01	0.01	0.01	0.02	0.04	0.02	0.06	0.04	0.00	0.05	0.02	0.01	0.05	0.04	0.00	0.02	0.05	0.02	0.00		
Total	99.28	99.22	99.17	99.51	99.40	99.71	99.80	99.39	99.58	99.67	98.40	98.72	99.20	98.96	98.84	97.81	97.91	99.25	99.97	100.11		
Cation per 6 oxygens																						
Si	2.021	2.016	2.022	2.026	2.032	2.025	2.029	2.021	2.023	2.016	2.028	2.018	2.024	2.024	2.029	2.029	2.027	2.020	1.990	1.988		
Ti	0.006	0.008	0.002	0.004	0.003	0.003	0.003	0.002	0.001	0.008	0.002	0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.001	0.000		
Al	0.350	0.314	0.301	0.306	0.287	0.339	0.309	0.345	0.297	0.301	0.319	0.357	0.323	0.355	0.347	0.391	0.384	0.341	0.429	0.430		
Fe	0.321	0.335	0.328	0.336	0.343	0.318	0.337	0.323	0.328	0.351	0.319	0.325	0.319	0.321	0.326	0.319	0.316	0.332	0.143	0.125		
Mn	0.002	0.001	0.001	0.002	0.001	0.002	0.003	0.003	0.001	0.002	0.001	0.003	0.003	0.003	0.003	0.003	0.001	0.001	0.002	0.001		
Mg	0.328	0.360	0.369	0.362	0.364	0.336	0.352	0.329	0.379	0.365	0.359	0.333	0.355	0.328	0.320	0.300	0.302	0.337	0.459	0.477		
Ca	0.487	0.515	0.547	0.513	0.536	0.501	0.508	0.487	0.546	0.528	0.523	0.485	0.522	0.482	0.484	0.434	0.443	0.494	0.527	0.536		
Na	0.566	0.535	0.510	0.530	0.507	0.550	0.541	0.577	0.502	0.506	0.514	0.549	0.522	0.562	0.562	0.586	0.601	0.552	0.483	0.477		
K	0.002	0.002	0.003	0.003	0.001	0.003	0.002	0.003	0.002	0.002	0.002	0.004	0.003	0.002	0.004	0.000	0.002	0.002	0.002	0.001		
Cr	0.001	0.000	0.000	0.000	0.001	0.001	0.001	0.002	0.001	0.000	0.001	0.000	0.000	0.002	0.001	0.000	0.001	0.001	0.000	0.000		
Total	4.082	4.088	4.082	4.083	4.076	4.079	4.085	4.093	4.080	4.079	4.068	4.077	4.074	4.078	4.077	4.068	4.080	4.083	4.036	4.036		

\*Total Fe as FeO

Lithology																
Sample	core															
No.	rim	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
SiO2	54.71	55.02	55.41	55.48	55.02	54.63	54.94	55.20	54.76	55.25	54.56	54.96	55.13	53.83	55.52	
TiO2	0.06	0.07	0.01	0.05	0.02	0.08	0.08	0.06	0.06	0.02	0.05	0.07	0.06	0.12	0.07	
Al2O3	10.19	10.26	10.13	10.43	9.97	10.06	10.29	10.19	8.53	10.60	10.10	10.18	10.49	10.11	10.36	
FeO*	5.68	5.30	4.41	4.17	7.42	5.81	5.53	4.95	7.59	4.36	5.98	5.77	5.48	6.34	3.97	
MnO	0.05	0.02	0.07	0.02	0.00	0.10	0.12	0.09	0.03	0.00	0.04	0.02	0.11	0.03	0.01	
MgO	7.91	8.11	8.50	8.63	6.85	7.91	8.04	8.36	7.81	8.49	7.86	8.08	7.92	8.92	8.81	
CaO	13.57	13.70	13.68	13.88	12.11	13.73	13.31	13.72	13.56	13.78	13.76	13.54	13.38	13.68	13.87	
Na2O	6.82	6.93	6.98	6.97	8.00	6.74	7.09	7.00	6.80	7.08	6.91	6.87	6.97	6.34	6.90	
K2O	0.02	0.03	0.03	0.05	0.04	0.05	0.03	0.03	0.04	0.05	0.05	0.04	0.05	0.08	0.03	
Cr2O3	0.07	0.00	0.00	0.02	0.00	0.02	0.05	0.03	0.03	0.04	0.03	0.05	0.01	0.00	0.03	
Total	99.06	99.45	99.21	99.69	99.43	99.13	99.46	99.62	99.21	99.65	99.33	99.56	99.59	99.44	99.56	
Cation per 6 oxygens																
Si	1.985	1.986	1.996	1.987	2.002	1.984	1.985	1.987	2.005	1.982	1.980	1.985	1.986	1.955	1.989	
Ti	0.002	0.002	0.000	0.001	0.001	0.002	0.002	0.002	0.002	0.000	0.001	0.002	0.002	0.003	0.002	
Al	0.436	0.436	0.430	0.440	0.428	0.431	0.438	0.432	0.368	0.448	0.432	0.433	0.446	0.433	0.437	
Fe	0.172	0.160	0.133	0.125	0.226	0.176	0.167	0.149	0.232	0.131	0.182	0.174	0.165	0.193	0.119	
Mn	0.002	0.001	0.002	0.001	0.000	0.003	0.004	0.003	0.001	0.000	0.001	0.000	0.003	0.001	0.000	
Mg	0.428	0.436	0.456	0.461	0.371	0.428	0.433	0.449	0.426	0.454	0.426	0.435	0.426	0.483	0.470	
Ca	0.528	0.530	0.528	0.533	0.472	0.534	0.515	0.529	0.532	0.530	0.535	0.524	0.516	0.532	0.532	
Na	0.480	0.485	0.487	0.484	0.565	0.475	0.496	0.488	0.483	0.492	0.486	0.481	0.487	0.446	0.479	
K	0.001	0.002	0.002	0.002	0.002	0.002	0.001	0.001	0.002	0.002	0.002	0.002	0.002	0.003	0.002	
Cr	0.002	0.000	0.000	0.001	0.000	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.000	0.001	
Total	4.035	4.037	4.034	4.034	4.067	4.037	4.042	4.040	4.051	4.040	4.046	4.037	4.033	4.050	4.031	

\*Total Fe as FeO

in A : inclusion in amphibole

Chemical compositions of the constituent minerals of the Gazo mass, a tectonic block  
in the Sambagawa metamorphic belt, Besshi district, central Shikoku, Japan

Table 3. Chemical compositions of amphiboles

Lithology	basic schist														basic schist										
	SN61							SN147B							SN30B										
	rim		core		core			rim		rim		core			rim		core		rim		core		rim		core
No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
SiO <sub>2</sub>	50.71	48.98	48.53	47.70	48.04	45.48	44.78	44.47	44.67	46.17	45.70	45.75	48.88	45.56	44.71	46.32	45.15	44.89	45.29	46.11					
TiO <sub>2</sub>	0.19	0.28	0.32	0.38	0.24	0.37	0.64	0.63	0.60	0.42	0.41	0.46	0.19	0.29	0.43	0.35	0.66	0.43	0.45	0.43					
Al <sub>2</sub> O <sub>3</sub>	7.28	11.02	11.23	12.12	11.84	12.21	13.97	14.27	14.18	12.79	13.02	12.98	8.33	11.96	12.86	12.05	13.68	12.07	12.18	12.07					
FeO*	11.67	12.24	12.24	12.07	12.69	16.78	16.69	15.84	15.96	15.93	15.97	15.75	16.26	17.49	15.65	15.52	16.71	16.61	16.61	16.39					
MnO	0.25	0.25	0.21	0.29	0.28	0.17	0.17	0.07	0.12	0.17	0.13	0.12	0.15	0.17	0.14	0.10	0.11	0.24	0.24	0.21					
MgO	13.86	11.90	11.50	11.37	10.98	8.99	8.41	8.68	8.83	9.33	8.88	9.03	11.04	9.15	9.01	9.77	9.03	9.00	9.16	9.37					
CaO	10.48	8.48	8.44	8.49	9.26	9.67	8.05	7.95	7.72	8.24	8.55	8.23	10.14	9.78	9.87	9.22	8.14	8.39	7.52	7.61					
Na <sub>2</sub> O	2.09	3.37	3.44	3.46	3.14	2.84	4.02	4.07	4.10	3.79	3.56	3.74	2.26	2.90	3.13	3.20	4.09	4.03	4.29	4.19					
K <sub>2</sub> O	0.18	0.29	0.34	0.41	0.31	0.48	0.72	0.69	0.61	0.57	0.61	0.63	0.35	0.47	0.61	0.48	0.71	0.63	0.62	0.58					
Cr <sub>2</sub> O <sub>3</sub>	0.02	0.08	0.05	0.04	0.06	0.05	0.03	0.00	0.01	0.00	0.01	0.01	0.00	0.00	0.00	0.01	0.01	0.04	0.02	0.00					
Total	96.73	96.89	96.30	96.32	96.84	97.04	97.48	96.68	96.80	97.45	96.81	96.91	97.08	96.54	98.25	97.15	97.10	96.414	96.378	96.960					
Cation per 23 oxygens																									
Si	7.354	7.099	7.082	6.968	7.001	6.785	6.650	6.630	6.646	6.813	6.794	6.793	7.216	6.819	6.635	6.850	6.693	6.762	6.801	6.858					
Ti	0.020	0.031	0.035	0.042	0.026	0.041	0.072	0.071	0.068	0.046	0.051	0.051	0.021	0.032	0.048	0.039	0.074	0.048	0.051	0.048					
Al	1.244	1.883	1.931	2.086	2.033	2.147	2.445	2.507	2.487	2.225	2.282	2.271	1.450	2.111	2.250	2.101	2.390	2.143	2.156	2.116					
Fe	1.415	1.484	1.494	1.475	1.546	2.094	2.072	1.976	1.986	1.970	1.981	1.983	1.944	2.036	2.170	1.936	1.924	2.105	2.086	2.038					
Mn	0.031	0.031	0.026	0.036	0.035	0.022	0.022	0.009	0.015	0.021	0.016	0.015	0.018	0.021	0.018	0.012	0.014	0.030	0.030	0.027					
Mg	2.997	2.571	2.502	2.477	2.386	1.999	1.862	1.930	1.959	2.053	1.967	1.998	2.429	2.041	1.994	2.155	1.995	2.020	2.049	2.078					
Ca	1.629	1.317	1.320	1.328	1.447	1.546	1.282	1.270	1.230	1.303	1.361	1.310	1.604	1.568	1.570	1.462	1.293	1.354	1.210	1.213					
Na	0.586	0.947	0.973	0.980	0.886	0.822	1.157	1.176	1.183	1.085	1.026	1.077	0.646	0.843	0.900	0.918	1.175	1.177	1.250	1.209					
K	0.034	0.054	0.063	0.076	0.058	0.091	0.136	0.132	0.115	0.108	0.115	0.120	0.067	0.089	0.116	0.090	0.133	0.121	0.119	0.109					
Cr	0.002	0.009	0.006	0.005	0.007	0.006	0.004	0.000	0.001	0.000	0.001	0.002	0.000	0.000	0.001	0.001	0.001	0.004	0.002	0.000					
Total	15.313	15.425	15.432	15.472	15.425	15.554	15.700	15.700	15.691	15.624	15.590	15.618	15.395	15.559	15.700	15.564	15.692	15.765	15.754	15.696					
*Total Fe as FeO																									

Lithology	basic schist														eclogite											
	SN24B							SN24							SN24											
	core		rim		core			rim		core		rim		core		rim		core		rim		core		rim		core
No.	4	5	6	7	8	14	15	16	18	19	20	21	22	23	24	21	22	23	24	25						
SiO <sub>2</sub>	46.45	46.51	46.10	45.44	44.42	44.07	45.75	48.47	45.90	45.66	46.35	45.92	46.40	46.26	45.79	48.53	44.89	45.40	45.37	46.94						
TiO <sub>2</sub>	0.38	0.41	0.41	0.49	0.59	0.43	0.49	0.27	0.37	0.38	0.46	0.48	0.47	0.31	0.56	0.46	0.24	0.52	0.57	0.34						
Al <sub>2</sub> O <sub>3</sub>	11.60	11.54	11.77	11.82	12.74	12.73	11.76	10.08	12.82	13.74	13.19	13.40	13.56	11.83	14.55	7.01	11.02	13.39	13.65	11.92						
FeO*	16.04	15.58	16.34	16.43	16.99	17.54	16.91	15.56	14.56	13.89	13.07	12.61	12.83	14.13	13.39	16.33	18.10	14.63	14.37	14.33						
MnO	0.19	0.11	0.22	0.20	0.21	0.23	0.20	0.24	0.17	0.22	0.15	0.12	0.20	0.09	0.07	0.27	0.24	0.15	0.13	0.14						
MgO	9.75	9.85	9.39	9.28	8.83	8.64	9.22	10.17	10.22	9.64	10.56	10.62	10.65	10.67	10.21	11.47	9.06	9.96	10.04	10.29						
CaO	7.37	7.18	7.58	7.56	7.86	8.00	7.49	6.53	10.19	9.17	8.40	8.43	8.46	10.27	8.55	10.43	10.06	8.58	8.48	8.39						
Na <sub>2</sub> O	4.43	4.33	4.14	4.26	4.15	4.11	4.20	4.36	3.16	3.61	3.73	3.71	3.92	2.83	3.86	2.21	3.12	4.29	4.33	4.21						
K <sub>2</sub> O	0.51	0.51	0.52	0.57	0.74	0.66	0.53	0.37	0.60	0.62	0.52	0.58	0.59	0.47	0.65	0.57	0.85	0.66	0.66	0.47						
Cr <sub>2</sub> O <sub>3</sub>	0.00	0.01	0.03	0.02	0.02	0.00	0.03	0.00	0.07	0.02	0.04	0.01	0.03	0.02	0.07	0.02	0.03	0.00	0.04	0.00						
Total	96.72	96.01	96.50	96.06	96.55	96.41	96.58	96.04	98.06	96.95	96.46	95.88	97.09	96.88	97.71	97.30	97.61	97.59	97.64	97.01						
Cation per 23 oxygens																										
Si	6.910	6.944	6.886	6.837	6.689	6.668	6.852	7.192	6.722	6.727	6.812	6.781	6.775	6.830	6.664	7.209	6.755	6.683	6.665	6.909						
Ti	0.043	0.045	0.046	0.055	0.067	0.049	0.055	0.030	0.041	0.042	0.051	0.053	0.052	0.034	0.062	0.052	0.027	0.057	0.063	0.037						
Al	2.034	2.030	2.073	2.096	2.261	2.270	2.076	1.762	2.214	2.386	2.285	2.333	2.333	2.059	2.496	1.228	1.955	2.323	2.363	2.068						
Fe	1.996	1.945	2.042	2.067	2.139	2.219	2.118	1.932	1.784	1.712	1.606	1.557	1.567	1.745	1.630	2.028	2.277	1.801	1.765	1.763						
Mn	0.024	0.014	0.028	0.025	0.027	0.030	0.026	0.030	0.022	0.027	0.019	0.015	0.024	0.012	0.009	0.034	0.030	0.018	0.016	0.017						
Mg	2.163	2.191	2.092	2.081	1.982	1.949	2.059	2.250	2.232	2.117	2.313	2.338	2.317	2.348	2.214	2.541	2.031	2.186	2.198	2.258						
Ca	1.175	1.148	1.213	1.219	1.269	1.297	1.201	1.038	1.599	1.448	1.322	1.334	1.323	1.625	1.333	1.660	1.622	1.353	1.334	1.323						
Na	1.277	1.254	1.198	1.243	1.210	1.206	1.220	1.254	0.896	1.032	1.062	1.061	1.109	0.810	1.089	0.637	0.911	1.225	1.234	1.200						
K	0.097	0.096	0.098	0.110	0.141	0.127	0.101	0.071	0.112	0.116	0.098	0.109	0.110	0.088	0.121	0.107	0.164	0.125	0.123	0.089						
Cr	0.000	0.001	0.003	0.002	0.003	0.000	0.003	0.000	0.008	0.002	0.004	0.001	0.004	0.002	0.008	0.002	0.004	0.000	0.005	0.000						
Total	15.718	15.670	15.678	15.735	15.788	15.815	15.713	15.559	15.630	15.610	15.573	15.583	15.614	15.554	15.626	15.497	15.776	15.772	15.766	15.664						
*Total Fe as FeO																										

Lithology	eclogite																								
	SN30																								
	rim		rim		core		rim		core		rim		core		rim		core		rim		core				
No.	26	27	32	33	62	63	1	2	3	4	5	8	9	42	45	23	49	50	51	52					
SiO <sub>2</sub>	47.66	45.61	44.58	46.52	45.30	45.00	45.78	44.11	43.58	43.32	45.65	45.51	43.81	41.21	41.09	45.02	4								

Table 3. (Continued)

Lithology		eclogite																																						
Sample		SN106B																																						
No.		rim			←			→			rim			in G			in G			in G			rim			rim			←			core			→			rim		
		53	81	82	83	84	85	86	87	88	116	117	118	130	6	7	8	9	10	11	18																			
SiO <sub>2</sub>	45.51	46.39	43.42	43.34	43.77	43.56	43.75	44.44	45.31	43.35	45.08	42.49	42.92	42.38	44.65	44.69	46.11	46.37	44.97	45.97																				
TiO <sub>2</sub>	0.49	0.40	0.67	0.70	0.65	0.71	0.67	0.50	0.40	0.68	0.97	0.50	0.38	0.59	0.59	0.59	0.41	0.47	0.57	0.50																				
Al <sub>2</sub> O <sub>3</sub>	12.45	10.49	12.67	12.47	12.38	12.47	12.35	11.94	10.50	12.30	11.37	13.16	12.49	14.43	13.27	13.33	12.56	12.65	13.66	13.11																				
FeO*	16.95	20.66	20.83	20.57	21.46	21.07	20.42	20.31	20.54	23.09	22.52	23.14	21.71	17.04	15.81	15.69	15.22	15.29	15.81	15.89																				
MnO	0.34	0.11	0.14	0.13	0.15	0.08	0.16	0.10	0.15	0.31	0.10	0.30	0.11	0.21	0.09	0.08	0.08	0.09	0.06	0.13																				
MgO	9.12	7.16	6.76	6.87	6.58	6.70	6.81	6.81	7.24	5.75	6.10	5.33	6.04	8.40	9.02	9.06	9.39	9.27	8.77	9.33																				
CaO	7.59	6.29	7.29	7.51	7.32	7.30	7.30	6.94	6.77	7.25	6.37	7.07	7.27	8.69	7.75	7.68	7.24	7.10	7.44	7.19																				
Na <sub>2</sub> O	5.20	5.10	4.79	4.54	4.70	4.77	4.61	4.69	4.77	5.17	5.41	5.25	5.08	3.83	4.21	4.52	4.61	4.38	4.47	4.45																				
K <sub>2</sub> O	0.59	0.41	0.70	0.80	0.76	0.74	0.71	0.61	0.37	0.16	0.12	0.16	0.35	0.88	0.69	0.63	0.50	0.54	0.60	0.55																				
Cr <sub>2</sub> O <sub>3</sub>	0.00	0.00	0.02	0.00	0.03	0.04	0.04	0.00	0.04	0.11	0.05	0.04	0.05	0.00	0.04	0.02	0.00	0.01	0.04	0.04																				
Total	98.23	97.01	97.28	96.93	97.79	97.45	96.80	96.33	96.08	98.17	98.09	97.44	96.40	96.44	96.11	96.29	96.13	96.17	96.39	97.17																				
Cation per 23 oxgens																																								
Si	6.737	7.023	6.623	6.633	6.658	6.641	6.687	6.799	6.945	6.619	6.824	6.542	6.637	6.427	6.700	6.694	6.869	6.893	6.716	6.795																				
Ti	0.055	0.045	0.077	0.080	0.074	0.082	0.077	0.058	0.047	0.078	0.110	0.058	0.045	0.067	0.067	0.067	0.046	0.053	0.064	0.056																				
Al	2.172	1.872	2.279	2.250	2.219	2.241	2.224	2.152	1.897	2.213	2.029	2.388	2.276	2.579	2.347	2.353	2.206	2.217	2.404	2.284																				
Fe	2.098	2.616	2.657	2.632	2.730	2.686	2.610	2.599	2.633	2.948	2.851	2.980	2.807	2.160	1.984	1.965	1.896	1.901	1.975	1.965																				
Mn	0.043	0.014	0.018	0.016	0.019	0.010	0.020	0.013	0.019	0.040	0.013	0.039	0.015	0.027	0.012	0.010	0.009	0.011	0.007	0.016																				
Mg	2.012	1.615	1.536	1.568	1.493	1.521	1.553	1.552	1.654	1.310	1.376	1.224	1.391	1.898	2.017	2.024	2.085	2.055	1.951	2.055																				
Ca	1.204	1.020	1.191	1.232	1.194	1.193	1.196	1.137	1.112	1.186	1.034	1.167	1.204	1.412	1.246	1.232	1.156	1.131	1.191	1.139																				
Na	1.492	1.497	1.417	1.347	1.385	1.410	1.365	1.392	1.418	1.531	1.589	1.567	1.523	1.126	1.226	1.312	1.332	1.261	1.294	1.276																				
K	0.111	0.080	0.136	0.156	0.147	0.145	0.138	0.118	0.071	0.030	0.023	0.031	0.070	0.171	0.132	0.120	0.095	0.102	0.113	0.104																				
Cr	0.000	0.000	0.003	0.000	0.003	0.004	0.004	0.000	0.005	0.013	0.005	0.005	0.006	0.000	0.005	0.002	0.000	0.002	0.005	0.005																				
Total	15.924	15.784	15.936	15.914	15.922	15.933	15.874	15.822	15.802	15.970	15.854	16.002	15.974	15.866	15.736	15.779	15.695	15.626	15.720	15.695																				
*Total Fe as FeO																																								

Lithology		eclogite																													
Sample		SN138A																													
No.		core		rim		in O		in O		in O		in O		in O		rim in O		core in O		rim in O		intermediate		←		core		→		rim	
		19	20	21	3	17	21	22	48	49	53	61	62	63	80	22	23	24	25	26	27										
SiO <sub>2</sub>	45.89	45.95	44.98	45.77	44.12	43.70	45.97	51.29	51.14	45.49	44.61	44.57	44.33	47.50	45.78	46.17	46.09	46.22	45.89	45.37											
TiO <sub>2</sub>	0.47	0.52	0.51	0.75	0.63	0.42	0.55	0.17	0.18	0.38	0.56	0.60	0.64	0.28	0.51	0.45	0.45	0.47	0.47	0.55											
Al <sub>2</sub> O <sub>3</sub>	12.92	13.14	12.92	9.52	11.66	13.25	10.90	4.78	5.24	10.93	11.40	12.60	12.22	8.81	13.65	12.90	13.15	13.26	13.19	13.87											
FeO*	15.50	15.70	15.74	18.20	18.71	17.07	15.99	13.43	14.66	18.46	18.65	19.00	18.49	15.79	12.48	12.54	12.78	13.08	12.21	12.71											
MnO	0.11	0.16	0.11	0.23	0.22	0.11	0.14	0.14	0.21	0.11	0.27	0.16	0.21	0.11	0.08	0.03	0.09	0.10	0.03	0.10											
MgO	9.52	9.29	9.34	9.83	8.59	8.59	10.34	13.84	13.01	8.32	8.93	7.85	8.21	11.08	11.01	11.27	11.17	11.29	11.07	10.77											
CaO	7.36	7.46	8.18	10.13	9.63	8.85	9.40	10.68	10.17	8.25	9.53	7.48	8.72	9.81	8.38	8.39	8.19	8.28	8.33	8.54											
Na <sub>2</sub> O	4.28	4.25	3.90	3.08	3.69	4.09	3.72	2.12	2.30	4.20	3.67	4.68	4.16	2.89	4.25	4.09	4.11	4.23	4.29	4.44											
K <sub>2</sub> O	0.52	0.54	0.62	0.31	0.25	0.37	0.22	0.26	0.22	0.46	0.25	0.55	0.35	0.60	0.52	0.48	0.47	0.46	0.49	0.48											
Cr <sub>2</sub> O <sub>3</sub>	0.01	0.00	0.02	0.03	0.03	0.03	0.00	0.07	0.03	0.01	0.03	0.04	0.05	0.02	0.05	0.06	0.02	0.04	0.04	0.06											
Total	96.58	97.01	96.31	97.84	97.52	96.46	97.22	96.79	97.15	96.60	97.89	97.52	97.36	96.90	96.72	96.38	96.54	97.44	96.00	96.89											
Cation per 23 oxgens																															
Si	6.811	6.797	6.731	6.852	6.653	6.597	6.833	7.513	7.494	6.882	6.693	6.700	6.675	7.069	6.712	6.786	6.769	6.738	6.766	6.660											
Ti	0.052	0.058	0.058	0.084	0.071	0.048	0.062	0.019	0.019	0.043	0.064	0.068	0.073	0.031	0.056	0.050	0.050	0.052	0.052	0.061											
Al	2.261	2.292	2.279	1.679	2.073	2.358	1.909	0.825	0.906	1.950	2.016	2.233	2.168	1.545	2.359	2.235	2.276	2.278	2.292	2.400											
Fe	1.925	1.942	1.970	2.279	2.359	2.155	1.988	1.645	1.796	2.335	2.340	2.389	2.328	1.966	1.530	1.542	1.570	1.595	1.506	1.560											
Mn	0.014	0.021	0.014	0.030	0.028	0.014	0.018	0.017	0.026	0.014	0.034	0.020	0.026	0.014	0.009	0.003	0.011	0.013	0.004	0.012											
Mg	2.106	2.048	2.083	2.193	1.930	1.933	2.290	3.021	2.842	1.876	1.996	1.760	1.842	2.459	2.407	2.469	2.445	2.454	2.434	2.357											
Ca	1.171	1.182	1.312	1.624	1.557	1.432	1.496	1.676	1.597	1.337	1.532	1.204	1.406	1.565	1.317	1.322	1.289	1.293	1.316	1.343											
Na	1.232	1.219	1.130	0.893	1.080	1.196	1.071	0.603	0.652	1.231	1.068	1.365	1.215	0.833	1.208	1.165	1.171	1.196	1.226	1.263											
K	0.098	0.101	0.117	0.059	0.047	0.071	0.041	0.048	0.042	0.089	0.047	0.105	0.067	0.114	0.097	0.090	0.088	0.086	0.092	0.091											
Cr	0.002	0.000	0.002	0.004	0.003	0.003	0.000	0.009	0.004	0.001	0.003	0.004	0.005	0.002	0.006	0.007	0.003	0.004	0.004	0.006											
Total	15.671	15.660	15.695	15.698	15.801	15.807	15.708	15.377	15.379	15.759	15.792	15.848	15.806	15.599	15.702	15.670	15.672	15.710	15.692	15.753											
*Total Fe as FeO																															

Lithology		pelitic schist											
Sample		SN26A											
No.		rim		←		core		→		rim		rim	
		28	29	30	29	30	31	32	33	34			
SiO <sub>2</sub>	45.26	48.00	47.56	45.41	44.80	45.28	45.35	45.62	45.27				
TiO <sub>2</sub>	0.49	0.32	0.37	0.52	0.53	0.47	0.52	0.56	0.55				
Al <sub>2</sub> O <sub>3</sub>	13.95	11.24	11.79	14.11	14.10	14.29	14.56	14.71	14.59				
FeO*	13.07	12.19	11.81	13.22	13.10	12.49	12.31	12.42	12.52				
MnO	0.12	0.06	0.05	0.10	0.09	0.04	0.04	0.00	0.06				
MgO	10.60	12.28	11.94	10.45	10.66	10.68	10.64	10.67	10.45				
CaO	8.34	7.93	8.18	8.52	8.57	8.20	7.67	7.53	7.77				
Na <sub>2</sub> O	4.28	4.15	4.04	3.66	3.59	3.78	4.17	4.14	4.04				
K <sub>2</sub> O	0.51	0.28	0.30	0.54	0.52	0.53	0.57	0.57	0.57				
Cr <sub>2</sub> O <sub>3</sub>	0.00	0.09	0.03	0.03	0.03	0.00	0.00	0.00	0.00				
Total	96.62	96.54	96.06	96.56	96.00	95.75	95.81	96.22	95.82				
Cation per 23 oxgens													
Si	6.665	7.000	6.962	6.681	6.636	6.688	6.685	6.690	6.680				
Ti	0.054	0.035	0.041	0.057	0.059	0.052	0.057	0.062	0.061				
Al	2.421	1.931	2.033	2.448	2.461	2.488	2.529	2.542	2				

Chemical compositions of the constituent minerals of the Gazo mass, a tectonic block  
in the Sambagawa metamorphic belt, Besshi district, central Shikoku, Japan

Table 4. Chemical compositions of white micas

Lithology		pelitic schist																			
Sample		G20																			
No.		in G	in G	in G	in G	in G	in G	in G	in G	in G	in G	in G	in G	in G	in G	in G	in G	in G	in G	in G	
		1	2	7	8	10	12	13	16	17	20	22	23	24	25	26	33	34	35	36	37
SiO <sub>2</sub>		44.87	44.16	45.68	45.23	43.99	45.18	46.56	44.87	45.96	46.54	46.31	47.20	45.82	45.77	46.25	45.76	46.00	46.31	45.56	45.70
TiO <sub>2</sub>		0.11	0.09	0.05	0.09	0.07	0.06	0.01	0.05	0.04	0.05	0.11	0.06	0.07	0.03	0.08	0.04	0.02	0.08	0.05	0.15
Al <sub>2</sub> O <sub>3</sub>		40.55	40.01	39.36	39.47	39.08	40.20	39.75	40.50	39.62	38.96	38.42	38.71	37.95	38.22	38.45	38.14	38.26	38.54	38.52	37.84
FeO*		0.85	1.61	0.79	0.75	1.13	0.64	0.73	0.84	0.59	0.73	0.37	0.24	0.35	0.24	0.37	0.26	0.32	0.26	0.31	0.34
MnO		0.02	0.04	0.06	0.01	0.03	0.07	0.05	0.01	0.00	0.00	0.00	0.02	0.03	0.00	0.02	0.00	0.05	0.00	0.00	0.00
MgO		0.05	0.14	0.10	0.05	0.19	0.05	0.04	0.04	0.08	0.08	0.18	0.15	0.17	0.12	0.14	0.12	0.11	0.11	0.07	0.14
CaO		1.13	1.54	0.53	0.65	1.35	0.80	0.33	1.30	0.43	0.25	0.18	0.11	0.12	0.09	0.16	0.14	0.15	0.15	0.12	0.18
Na <sub>2</sub> O		6.99	6.68	7.11	7.23	6.14	6.55	6.95	6.61	7.01	7.15	6.63	6.96	6.73	6.99	7.01	6.85	6.92	7.28	7.18	6.74
K <sub>2</sub> O		0.40	0.32	0.60	0.24	1.00	0.74	0.46	0.26	0.27	0.33	1.19	0.90	0.96	0.77	0.76	0.84	0.87	0.69	0.52	1.11
Cr <sub>2</sub> O <sub>3</sub>		0.01	0.01	0.02	0.01	0.00	0.01	0.01	0.02	0.02	0.02	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00
Total		94.96	94.59	94.28	93.74	92.98	94.32	94.89	94.49	94.03	94.12	93.39	94.34	92.18	92.23	93.25	92.15	92.70	93.42	92.31	92.19
Cation per 22 oxygens																					
Si		5.785	5.745	5.921	5.889	5.813	5.850	5.971	5.801	5.944	6.016	6.040	6.080	6.048	6.033	6.035	6.038	6.039	6.032	5.999	6.041
Ti		0.010	0.009	0.005	0.009	0.007	0.006	0.001	0.004	0.004	0.005	0.011	0.006	0.006	0.003	0.008	0.004	0.002	0.007	0.005	0.015
Al		6.162	6.135	6.013	6.057	6.087	6.136	6.009	6.172	6.040	5.935	5.907	5.876	5.904	5.938	5.913	5.932	5.921	5.916	5.978	5.895
Fe		0.092	0.176	0.085	0.082	0.125	0.070	0.079	0.091	0.063	0.079	0.040	0.026	0.039	0.026	0.041	0.028	0.035	0.028	0.035	0.037
Mn		0.002	0.004	0.006	0.002	0.004	0.008	0.006	0.001	0.000	0.000	0.000	0.002	0.003	0.000	0.002	0.000	0.005	0.000	0.000	0.000
Mg		0.009	0.026	0.019	0.010	0.038	0.010	0.008	0.008	0.016	0.016	0.034	0.029	0.033	0.024	0.027	0.024	0.022	0.021	0.013	0.027
Ca		0.156	0.215	0.074	0.091	0.192	0.111	0.046	0.180	0.059	0.035	0.026	0.015	0.017	0.013	0.022	0.020	0.021	0.021	0.016	0.026
Na		1.746	1.685	1.787	1.826	1.573	1.644	1.729	1.658	1.759	1.792	1.677	1.737	1.722	1.785	1.775	1.752	1.761	1.838	1.833	1.726
K		0.066	0.052	0.098	0.039	0.169	0.123	0.074	0.043	0.045	0.055	0.198	0.148	0.161	0.129	0.126	0.141	0.145	0.115	0.087	0.187
Cr		0.001	0.001	0.002	0.001	0.000	0.001	0.001	0.002	0.002	0.002	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000
Total		14.029	14.048	14.010	14.006	14.007	13.959	13.924	13.958	13.933	13.934	13.933	13.919	13.935	13.952	13.950	13.939	13.952	13.980	13.966	13.953
*Total Fe as FeO																					

Lithology		pelitic schist																			
Sample		G23B																			
No.		2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	3	4	5	6
SiO <sub>2</sub>		47.87	46.88	47.54	47.72	48.03	48.09	48.04	48.03	47.95	47.75	47.82	48.22	48.15	47.77	47.81	47.95	49.40	49.26	47.78	47.29
TiO <sub>2</sub>		0.32	0.50	0.45	0.48	0.50	0.50	0.49	0.40	0.48	0.57	0.59	0.58	0.55	0.55	0.54	0.60	0.15	0.18	0.30	0.37
Al <sub>2</sub> O <sub>3</sub>		27.73	29.31	28.10	28.60	28.52	28.31	28.43	27.86	28.59	28.31	28.15	28.49	28.48	28.72	28.56	28.16	25.86	25.61	28.13	28.51
FeO*		2.21	1.86	1.99	1.97	2.12	1.86	2.06	2.07	2.83	1.89	2.17	2.16	1.91	1.82	2.06	2.01	2.31	3.01	2.31	2.02
MnO		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.04	0.00	0.05	0.00	0.01
MgO		2.85	2.35	2.75	2.62	2.72	2.65	2.64	2.79	2.56	2.68	2.67	2.66	2.70	2.61	2.70	2.72	3.23	2.86	2.59	2.50
CaO		0.01	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Na <sub>2</sub> O		0.75	0.94	0.88	0.85	1.04	0.98	1.09	0.76	1.05	1.00	1.01	1.09	1.05	1.13	1.09	0.96	0.47	0.36	0.66	0.81
K <sub>2</sub> O		10.31	10.22	10.07	10.17	9.96	10.15	9.99	10.16	9.84	10.02	9.89	10.08	9.99	10.08	10.11	9.97	10.55	10.81	10.28	10.02
Cr <sub>2</sub> O <sub>3</sub>		0.03	0.02	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.02	0.00	0.01	0.02	0.02	0.01	0.02	0.00	0.04	0.04	0.02
Total		92.08	92.07	91.78	92.42	92.89	92.57	92.75	92.09	93.31	92.26	92.31	93.29	92.84	92.71	92.89	92.42	91.97	92.17	92.09	91.57
Cation per 22 oxygens																					
Si		6.636	6.493	6.599	6.578	6.586	6.615	6.598	6.643	6.566	6.591	6.600	6.591	6.600	6.564	6.565	6.606	6.849	6.852	6.620	6.577
Ti		0.034	0.052	0.047	0.050	0.052	0.051	0.042	0.050	0.059	0.061	0.060	0.057	0.057	0.056	0.062	0.062	0.016	0.018	0.031	0.039
Al		4.532	4.785	4.598	4.647	4.610	4.590	4.603	4.542	4.615	4.606	4.579	4.590	4.601	4.651	4.623	4.574	4.226	4.199	4.594	4.673
Fe		0.256	0.215	0.231	0.227	0.243	0.214	0.237	0.239	0.324	0.219	0.250	0.247	0.219	0.209	0.237	0.231	0.268	0.350	0.268	0.235
Mn		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.002	0.001	0.000	0.005	0.000	0.005	0.000	0.001
Mg		0.589	0.486	0.569	0.538	0.555	0.544	0.541	0.576	0.522	0.552	0.550	0.542	0.551	0.535	0.553	0.600	0.667	0.593	0.535	0.518
Ca		0.001	0.000	0.000	0.000	0.000	0.003	0.000	0.000	0.001	0.001	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002
Na		0.201	0.253	0.236	0.227	0.278	0.262	0.291	0.204	0.279	0.267	0.269	0.288	0.279	0.300	0.290	0.256	0.125	0.097	0.176	0.219
K		1.824	1.805	1.782	1.789	1.743	1.782	1.751	1.792	1.720	1.765	1.741	1.758	1.746	1.766	1.772	1.752	1.867	1.918	1.817	1.779
Cr		0.004	0.002	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.002	0.000	0.001	0.002	0.002	0.001	0.002	0.000	0.004	0.005	0.002
Total		14.075	14.091	14.063	14.057	14.067	14.061	14.071	14.042	14.076	14.062	14.053	14.077	14.055	14.086	14.097	14.048	14.018	14.036	14.046	14.045
*Total Fe as FeO																					

Lithology		pelitic schist																			
Sample		G25																			
No.		7	9	10	11	12	14	15	13	14	15	16	17	18	19	1	2	3	4	5	6
SiO <sub>2</sub>		45.41	45.36	49.00	48.01	48.01	48.16	46.86	47.60	47.29	47.58	48.12	48.52	48.59	47.75	47.50	47.67	47.46	47.81	47.48	46.82
TiO <sub>2</sub>		0.02	0.12	0.23	0.38	0.50	0.39	0.43	0.57	0.47	0.60	0.46	0.42	0.37	0.16						



Table 4. (Continued)

Lithology Sample	pelitic schist G26										pelitic schist G30B									
	7	8	9	10	17	18	19	20	21	22	25	26	1	2	3	4	5	6	7	8
SiO <sub>2</sub>	47.92	48.17	47.49	47.84	48.21	48.67	47.98	48.30	47.80	47.39	47.79	48.44	49.13	49.37	49.08	48.50	46.17	46.24	49.40	49.32
TiO <sub>2</sub>	0.37	0.36	0.58	0.58	0.37	0.39	0.57	0.19	0.64	0.60	0.61	0.33	0.49	0.51	0.60	0.55	0.16	0.11	0.59	0.58
Al <sub>2</sub> O <sub>3</sub>	27.76	27.79	28.39	28.49	28.61	28.20	29.27	28.54	28.20	28.79	27.94	27.99	27.47	27.72	27.17	27.74	37.78	37.95	28.09	28.14
FeO*	2.33	2.16	1.97	2.10	2.32	2.25	1.93	2.15	2.08	1.98	2.14	2.39	1.91	1.92	2.08	1.97	0.35	0.30	2.05	2.13
MnO	0.00	0.02	0.03	0.00	0.00	0.02	0.00	0.02	0.00	0.00	0.00	0.02	0.02	0.01	0.04	0.02	0.04	0.00	0.03	0.03
MgO	2.81	2.92	2.65	2.59	2.58	2.65	2.46	2.60	2.66	2.44	2.71	2.66	2.88	2.79	2.91	2.72	0.16	0.17	2.75	2.79
CaO	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.01	0.01	0.02	0.00	0.00	0.00	0.02	0.19	0.15	0.00	0.00
Na <sub>2</sub> O	0.73	0.74	0.79	0.91	0.75	0.77	0.94	0.63	0.90	0.97	0.99	0.75	0.72	0.88	0.88	0.92	6.88	6.94	0.95	0.96
K <sub>2</sub> O	10.09	10.07	9.67	9.69	10.43	10.49	10.13	10.71	10.34	9.91	10.24	10.60	10.31	10.24	10.25	9.88	0.99	0.71	10.20	10.19
Cr <sub>2</sub> O <sub>3</sub>	0.04	0.00	0.01	0.04	0.00	0.04	0.06	0.10	0.04	0.04	0.06	0.00	0.04	0.00	0.00	0.00	0.01	0.02	0.00	0.00
Total	92.06	92.22	91.58	92.24	93.27	93.47	93.35	93.24	92.67	92.13	92.48	93.18	92.97	93.45	93.02	92.33	92.72	92.59	94.05	94.14
Cation per 22 oxygens																				
Si	6.637	6.652	6.587	6.592	6.599	6.646	6.544	6.616	6.587	6.549	6.600	6.646	6.722	6.717	6.723	6.676	6.066	6.070	6.683	6.670
Ti	0.039	0.038	0.061	0.060	0.038	0.040	0.058	0.019	0.066	0.062	0.063	0.034	0.050	0.052	0.062	0.057	0.015	0.011	0.060	0.059
Al	4.532	4.522	4.641	4.627	4.616	4.539	4.705	4.608	4.580	4.689	4.549	4.527	4.430	4.446	4.387	4.501	5.851	5.871	4.480	4.486
Fe	0.270	0.249	0.228	0.242	0.265	0.257	0.220	0.247	0.240	0.229	0.247	0.274	0.219	0.219	0.239	0.227	0.038	0.033	0.232	0.241
Mn	0.000	0.002	0.004	0.000	0.000	0.002	0.000	0.003	0.000	0.000	0.000	0.002	0.003	0.001	0.005	0.002	0.004	0.000	0.003	0.004
Mg	0.581	0.602	0.548	0.532	0.527	0.539	0.501	0.532	0.547	0.502	0.558	0.543	0.588	0.566	0.595	0.559	0.031	0.034	0.555	0.563
Ca	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.001	0.001	0.001	0.002	0.000	0.000	0.000	0.002	0.020	0.000	0.000	0.000
Na	0.196	0.198	0.213	0.243	0.198	0.203	0.248	0.167	0.242	0.259	0.264	0.200	0.191	0.231	0.234	0.247	1.753	1.766	0.248	0.251
K	1.784	1.773	1.710	1.704	1.822	1.828	1.762	1.872	1.818	1.747	1.804	1.856	1.799	1.778	1.792	1.735	0.166	0.120	1.761	1.758
Cr	0.005	0.000	0.001	0.004	0.000	0.004	0.007	0.011	0.004	0.005	0.006	0.000	0.004	0.000	0.000	0.000	0.001	0.002	0.000	0.000
Total	14.045	14.035	13.993	14.005	14.065	14.058	14.047	14.075	14.085	14.045	14.093	14.085	14.006	14.011	14.035	14.007	13.952	13.926	14.021	14.032

\*Total Fe as FeO

Lithology Sample	pelitic schist SN26A																			
	in G								in G											
No.	9	10	11	12	13	14	15	16	17	19	20	23	9	10	11	13	15	16	17	20
SiO <sub>2</sub>	49.10	49.32	49.35	49.56	46.90	46.83	46.83	50.30	49.75	49.85	47.23	46.54	46.78	46.29	46.53	46.35	46.08	46.76	43.03	46.46
TiO <sub>2</sub>	0.55	0.51	0.55	0.53	0.07	0.11	0.09	0.41	0.29	0.29	0.05	0.07	0.04	0.10	0.11	0.18	0.11	0.10	0.15	0.05
Al <sub>2</sub> O <sub>3</sub>	27.98	27.93	27.68	27.79	38.23	38.18	37.19	27.06	26.24	25.95	37.44	38.38	38.89	38.24	38.64	37.37	38.80	38.59	41.56	39.06
FeO*	1.97	1.97	1.97	2.06	0.34	0.38	0.47	2.07	1.99	2.02	0.38	0.75	0.31	0.28	0.34	0.86	0.53	0.60	0.97	0.68
MnO	0.05	0.01	0.00	0.01	0.01	0.00	0.00	0.06	0.00	0.00	0.00	0.13	0.00	0.03	0.01	0.00	0.06	0.05	0.00	0.03
MgO	2.84	2.69	2.77	2.87	0.14	0.16	0.40	3.09	3.16	3.07	0.36	0.03	0.15	0.13	0.12	0.40	0.08	0.11	0.09	0.15
CaO	0.00	0.00	0.00	0.01	0.13	0.12	0.12	0.00	0.01	0.01	0.15	0.24	0.12	0.19	0.20	0.23	0.37	0.26	2.71	0.67
Na <sub>2</sub> O	1.01	0.92	0.90	0.81	6.92	7.22	6.50	0.63	0.59	0.66	6.55	6.45	6.85	6.59	6.51	6.18	7.11	7.19	6.04	7.04
K <sub>2</sub> O	10.10	10.21	10.13	10.30	0.83	0.89	1.73	10.50	10.73	10.47	1.12	0.45	0.71	0.64	1.02	1.61	0.08	0.78	0.09	0.70
Cr <sub>2</sub> O <sub>3</sub>	0.04	0.02	0.00	0.04	0.00	0.00	0.04	0.00	0.00	0.03	0.01	0.01	0.00	0.01	0.00	0.01	0.01	0.03	0.02	0.00
Total	93.64	93.56	93.36	93.97	93.58	93.88	93.37	94.12	92.76	92.35	93.28	93.06	93.85	92.49	93.48	93.19	93.24	94.45	94.66	94.82
Cation per 22 oxygens																				
Si	6.672	6.703	6.719	6.711	6.091	6.076	6.128	6.799	6.835	6.869	6.155	6.071	6.050	6.069	6.051	6.083	6.002	6.038	5.584	5.983
Ti	0.056	0.052	0.056	0.054	0.007	0.011	0.009	0.041	0.030	0.030	0.005	0.007	0.004	0.010	0.018	0.011	0.009	0.014	0.004	0.004
Al	4.482	4.475	4.442	4.435	5.853	5.838	5.737	4.312	4.250	4.215	5.751	5.901	5.929	5.909	5.923	5.781	5.957	5.873	6.356	5.928
Fe	0.224	0.224	0.224	0.233	0.037	0.041	0.051	0.234	0.228	0.233	0.041	0.082	0.034	0.030	0.037	0.095	0.058	0.065	0.106	0.073
Mn	0.006	0.001	0.000	0.001	0.000	0.000	0.000	0.007	0.000	0.000	0.000	0.014	0.000	0.004	0.002	0.000	0.007	0.005	0.000	0.004
Mg	0.576	0.544	0.563	0.580	0.028	0.031	0.078	0.622	0.646	0.631	0.069	0.006	0.030	0.024	0.022	0.078	0.015	0.021	0.017	0.030
Ca	0.000	0.000	0.000	0.001	0.019	0.016	0.017	0.000	0.002	0.002	0.021	0.034	0.016	0.026	0.028	0.032	0.052	0.036	0.076	0.092
Na	0.267	0.243	0.237	0.212	1.742	1.817	1.649	0.165	0.156	0.175	1.655	1.632	1.717	1.675	1.640	1.572	1.795	1.799	1.519	1.757
K	1.751	1.770	1.759	1.779	0.138	0.147	0.289	1.811	1.880	1.840	0.187	0.074	0.118	0.107	0.170	0.270	0.013	0.129	0.016	0.115
Cr	0.004	0.002	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.003	0.001	0.001	0.000	0.001	0.000	0.001	0.001	0.003	0.002	0.000
Total	14.038	14.013	14.002	14.011	13.915	13.976	13.962	13.992	14.028	13.999	13.885	13.823	13.898	13.857	13.883	13.929	13.912	13.978	13.990	13.985

\*Total Fe as FeO

Lithology Sample	in G																			
	21	1	2	3	4	5	6	7	8	9	10	11	12	13	14	1	9	10	11	12
SiO <sub>2</sub>	43.65	42.60	43.03	43.44	44.44	44.54	44.40	42.44	41.74	42.83	45.21	44.22	42.73	43.15	45.00	47.24	47.04	47.24	47.71	47.56
TiO <sub>2</sub>	0.07	0.07	0.07	0.07	0.09	0.03	0.03	0.09	0.10	0.05	0.02	0.06	0.06	0.07	0.07	0.60	0.62	0.59	0.53	0.57
Al <sub>2</sub> O <sub>3</sub>	41.65	41.43	41.18	40.82	40.02	40.15	39.42	41.58	41.45	40.72	39.05	39.00	40.16	40.36	39.26	28.57	28.84	28.92	28.08	28.89
FeO*	0.97	0.80	0.75	0.65	0.70	0.72	0.54	0.74	0.62	0.54	0.40	0.81	0.90	0.50	0.50	1.86	1.89	1.73	2.11	1.80
MnO	0.04	0.07	0.04	0.00	0.02	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.02	0.03	0.03
MgO	0.08	0.05	0.09	0.05	0.05	0.06	0.03	0.08	0.06	0.05	0.02	0.32	0.41	0.12	0.03	2.64	2.52	2.61	2.74	2.57
CaO	2.22	2.08	2.03	1.64	0.66	0.64	0.64	2.23	2.36	1.71	0.11	1.23	1.61	1.56	0.12	0.00	0.00	0.03	0.03	0.00
Na <sub>2</sub> O	6.30	6.69	6.86	6.99	6.46	6.67	6.91	6.66	6.33	6.61	7.00	6.56	6.32	6.52	6.91	0.91	1.17	1.20	0.92	1.21
K <sub>2</sub> O	0.11	0.17	0.15	0.19	0.34	0.33	0.28	0.14	0.19	0.25	0.45	0.75	0.96	0.46	0.09	9.67	9.73	9.83	10.14	9.85
Cr <sub>2</sub> O <sub>3</sub>	0.03	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.02	0.00	0.03	0.00	0.04	0.05	0.00	0.03	0.03	0.00	0.01	0.04
Total	95.10	93.96	94.20	93.86	92.78	93.15	92.													

Chemical compositions of the constituent minerals of the Gazo mass, a tectonic block  
in the Sambagawa metamorphic belt, Besshi district, central Shikoku, Japan

Table 4. (Continued)

Lithology	pelitic schist															
Sample	SN52D															
No.	13	14	15	16	19	20	21	26	1	2	3	4	5	6	7	8
SiO <sub>2</sub>	47.49	47.34	44.63	44.97	47.47	46.94	46.98	47.96	47.91	47.90	47.94	48.15	47.87	48.00	48.11	47.86
TiO <sub>2</sub>	0.58	0.63	0.19	0.15	0.62	0.63	0.62	0.48	0.37	0.56	0.52	0.29	0.33	0.31	0.40	0.32
Al <sub>2</sub> O <sub>3</sub>	28.46	28.46	37.46	37.50	29.11	28.82	28.91	28.14	28.02	27.85	27.66	27.62	27.57	27.79	27.87	28.05
FeO*	1.76	1.85	0.31	0.36	1.80	1.59	1.71	1.94	2.27	2.21	2.22	2.21	2.26	2.50	2.54	2.20
MnO	0.03	0.00	0.01	0.00	0.00	0.00	0.03	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.06
MgO	2.75	2.53	0.14	0.15	2.55	2.60	2.51	2.64	2.68	2.85	2.76	2.85	2.83	2.79	2.84	2.80
CaO	0.00	0.00	0.27	0.25	0.00	0.00	0.00	0.02	0.00	0.03	0.02	0.00	0.00	0.00	0.01	0.00
Na <sub>2</sub> O	1.26	1.07	6.66	6.76	1.03	1.19	1.13	0.87	0.79	0.89	1.01	0.75	0.79	0.67	0.75	0.76
K <sub>2</sub> O	9.86	9.95	1.14	1.09	9.82	9.83	9.78	10.10	10.21	9.92	10.02	10.20	10.18	9.86	10.06	10.13
Cr <sub>2</sub> O <sub>3</sub>	0.03	0.00	0.02	0.06	0.03	0.00	0.03	0.03	0.03	0.00	0.00	0.01	0.05	0.01	0.03	0.01
Total	92.21	91.82	90.82	91.28	92.43	91.60	91.70	92.19	92.28	92.20	92.15	92.08	91.88	91.97	92.66	92.15
Cation per 22 oxygens																
Si	6.558	6.565	5.996	6.012	6.529	6.519	6.518	6.624	6.624	6.619	6.636	6.666	6.648	6.648	6.629	6.620
Ti	0.060	0.066	0.019	0.015	0.064	0.066	0.065	0.050	0.039	0.058	0.054	0.030	0.034	0.032	0.041	0.034
Al	4.632	4.651	5.932	5.908	4.720	4.717	4.727	4.580	4.565	4.537	4.513	4.507	4.513	4.537	4.525	4.574
Fe	0.204	0.214	0.035	0.040	0.207	0.184	0.199	0.224	0.263	0.256	0.257	0.256	0.263	0.290	0.292	0.254
Mn	0.004	0.000	0.001	0.000	0.000	0.000	0.003	0.004	0.000	0.000	0.000	0.000	0.000	0.006	0.007	0.002
Mg	0.567	0.523	0.029	0.030	0.522	0.539	0.519	0.543	0.553	0.587	0.570	0.589	0.586	0.576	0.583	0.578
Ca	0.000	0.000	0.039	0.036	0.000	0.000	0.000	0.003	0.000	0.004	0.002	0.000	0.000	0.000	0.001	0.000
Na	0.337	0.286	1.735	1.752	0.274	0.320	0.303	0.232	0.212	0.237	0.272	0.201	0.213	0.179	0.200	0.204
K	1.737	1.760	0.195	0.185	1.724	1.742	1.731	1.780	1.800	1.749	1.770	1.802	1.804	1.742	1.768	1.787
Cr	0.003	0.000	0.003	0.006	0.003	0.000	0.003	0.003	0.003	0.000	0.000	0.001	0.005	0.001	0.003	0.001
Total	14.101	14.067	13.982	13.985	14.044	14.087	14.069	14.041	14.059	14.047	14.075	14.051	14.067	14.011	14.050	14.054

\*Total Fe as FeO

Table 5. Chemical compositions of epidote

Lithology	eclogite																			
Sample	SN30																			
No.	rim ← core							core												
	36	37	39	32	60	62	70	71	72	73	74	75	76	77	78	79	in O	in O	in O	in O
SiO <sub>2</sub>	37.54	37.42	37.30	37.29	37.11	37.33	38.08	37.71	38.11	37.67	38.17	37.40	37.84	37.90	38.07	37.86	37.55	39.88	37.76	38.12
TiO <sub>2</sub>	0.11	0.09	0.05	0.08	0.05	0.03	0.10	0.04	0.16	0.01	0.05	0.13	0.03	0.03	0.06	0.03	0.07	0.18	0.41	0.13
Al <sub>2</sub> O <sub>3</sub>	23.53	23.47	22.72	23.62	22.92	23.08	24.29	22.39	24.66	22.40	23.68	22.01	22.20	23.41	23.54	22.65	23.09	19.70	23.93	24.51
Fe <sub>2</sub> O <sub>3</sub> *	13.05	13.35	14.09	13.23	14.41	13.76	12.52	14.61	12.08	14.37	12.70	14.90	15.31	13.54	12.86	14.47	14.48	15.84	12.91	11.78
MnO	0.05	0.04	0.08	0.10	0.43	0.39	0.15	0.64	0.10	0.56	0.20	0.27	0.19	0.47	0.22	0.53	0.10	0.11	0.26	0.06
MgO	0.08	0.03	0.04	0.02	0.07	0.05	0.06	0.00	0.06	0.02	0.05	0.03	0.05	0.03	0.02	0.07	0.04	1.69	0.06	0.07
CaO	23.80	23.79	23.62	22.61	22.61	22.52	22.84	22.41	22.62	22.40	22.76	22.43	22.58	23.02	23.08	22.49	22.76	20.31	22.58	23.26
Na <sub>2</sub> O	0.00	0.00	0.00	0.01	0.03	0.00	0.00	0.00	0.01	0.02	0.00	0.03	0.00	0.00	0.00	0.01	0.28	0.02	0.02	0.02
K <sub>2</sub> O	0.04	0.04	0.06	0.05	0.01	0.04	0.03	0.05	0.06	0.03	0.02	0.05	0.06	0.03	0.04	0.03	0.10	0.04	0.06	0.06
Cr <sub>2</sub> O <sub>3</sub>	0.06	0.04	0.12	0.01	0.00	0.06	0.04	0.01	0.04	0.00	0.00	0.04	0.01	0.02	0.00	0.00	0.00	0.02	0.03	0.02
Total	98.27	98.26	98.08	97.01	97.62	97.26	98.10	97.86	97.89	97.49	97.63	97.29	98.26	98.46	97.88	98.14	98.13	98.11	97.99	98.03
Cation per 25 oxygens																				
Si	5.965	5.952	5.964	5.984	5.955	5.995	6.021	6.038	6.023	6.047	6.067	6.027	6.036	6.009	6.049	6.036	5.981	6.331	5.990	6.024
Ti	0.013	0.011	0.006	0.009	0.006	0.003	0.011	0.004	0.018	0.002	0.006	0.016	0.003	0.004	0.008	0.004	0.009	0.021	0.049	0.016
Al	4.407	4.399	4.281	4.468	4.334	4.368	4.527	4.225	4.593	4.238	4.437	4.181	4.174	4.376	4.409	4.256	4.336	3.687	4.475	4.564
Fe	1.560	1.598	1.695	1.597	1.740	1.663	1.490	1.760	1.436	1.735	1.519	1.807	1.838	1.616	1.537	1.736	1.735	1.893	1.541	1.401
Mn	0.007	0.005	0.010	0.014	0.058	0.053	0.020	0.087	0.013	0.076	0.027	0.037	0.025	0.062	0.030	0.071	0.013	0.015	0.035	0.007
Mg	0.019	0.008	0.010	0.006	0.016	0.013	0.013	0.001	0.015	0.006	0.012	0.006	0.012	0.007	0.004	0.016	0.010	0.400	0.014	0.016
Ca	4.052	4.055	4.046	3.888	3.887	3.875	3.869	3.844	3.830	3.853	3.877	3.873	3.860	3.910	3.929	3.841	3.885	3.455	3.839	3.938
Na	0.000	0.001	0.000	0.003	0.011	0.000	0.000	0.000	0.004	0.006	0.001	0.009	0.000	0.001	0.000	0.000	0.002	0.087	0.005	0.005
K	0.008	0.007	0.012	0.010	0.001	0.007	0.005	0.010	0.012	0.007	0.004	0.010	0.013	0.007	0.006	0.008	0.007	0.020	0.007	0.013
Cr	0.008	0.005	0.016	0.001	0.000	0.008	0.005	0.001	0.005	0.000	0.000	0.005	0.001	0.003	0.000	0.000	0.001	0.002	0.004	0.002
Total	16.039	16.041	16.040	15.980	16.008	15.986	15.960	15.970	15.949	15.971	15.950	15.971	15.961	15.994	15.973	15.968	15.979	15.911	15.958	15.986

\*Total Fe as Fe<sub>2</sub>O<sub>3</sub>

Lithology	eclogite									
Sample	SN106									
No.	in O					in O				
	16	18	34	43	52	54	55	57	72	76
SiO <sub>2</sub>	37.90	37.87	38.23	37.64	38.05	37.89	37.73	37.69	37.64	37.70
TiO <sub>2</sub>	0.15	0.12	0.11	0.06	0.17	0.11	0.05	0.06	0.08	0.09
Al <sub>2</sub> O <sub>3</sub>	23.85	24.14	24.01	23.69	25.21	23.92	23.54	22.85	24.47	24.41
Fe <sub>2</sub> O <sub>3</sub> *	13.16	12.31	12.88	12.94	10.18	13.08	13.66	14.66	11.75	12.28
MnO	0.07	0.12	0.03	0.03	0.11	0.13	0.08	0.07	0.16	0.14
MgO	0.06	0.06	0.05	0.05	0.08	0.07	0.05	0.06	0.06	0.03
CaO	23.13	23.12	23.00	23.22	23.27	22.96	22.87	23.15	23.29	
Na <sub>2</sub> O	0.01	0.01	0.04	0.01	0.03	0.01	0.00	0.02	0.00	0.01
K <sub>2</sub> O	0.02	0.04	0.06	0.03	0.47	0.06	0.01	0.04	0.03	0.04
Cr <sub>2</sub> O <sub>3</sub>	0.02	0.03	0.01	0.01	0.03	0.05	0.03	0.04	0.04	0.00
Total	98.38	97.81	98.41	97.68	97.58	98.27	98.11	98.34	97.37	98.00
Cation per 25 oxygens										
Si	5.995	6.010	6.032	5.998	6.023	5.999	5.994	5.995	5.994	5.976
Ti	0.018	0.015	0.013	0.007	0.020	0.013	0.006	0.007	0.009	0.011
Al	4.447	4.516	4.465	4.450	4.704	4.463	4.407	4.284	4.592	4.561
Fe	1.567	1.471	1.529	1.552	1.213	1.558	1.633	1.755	1.407	1.465
Mn	0.010	0.016	0.003	0.004	0.014	0.018	0.011	0.009	0.022	0.019
Mg	0.014	0.013	0.013	0.011	0.019	0.016	0.013	0.015	0.014	0.007
Ca	3.920	3.932	3.890	3.965	3.947	3.895	3.909	3.898	3.950	3.956
Na	0.004	0.002	0.012	0.004	0.010	0.004	0.000	0.006	0.000	0.002
K	0.005	0.008	0.012	0.007	0.094	0.012	0.002	0.008	0.006	0.008
Cr	0.003	0.003	0.001	0.001	0.003	0.006	0.004	0.005	0.005	0.000
Total	15.983	15.986	15.970	15.999	16.049	15.983	15.979	15.982	15.998	16.005

\*Total Fe as Fe<sub>2</sub>O<sub>3</sub>

in O : inclusion in omphacite

Table 6. Chemical compositions of chloritoid and talc

chloritoid															talc		
Lithology	pelitic schist														Lithology	eclogite	
Sample	SN26A														Sample	SN106C	
No.	in G	in G	in G	in G	in G	in G	in G	in G	in G	in G	in G	in G	in G	in G	No.	18	19
SiO <sub>2</sub>	23.93	23.78	24.21	24.18	24.21	24.21	24.14	23.89	23.59	23.91	24.01	23.98	24.11	24.44	SiO <sub>2</sub>	58.58	60.33
TiO <sub>2</sub>	0.01	0.01	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.01	0.02	0.01	0.00	0.00	TiO <sub>2</sub>	0.20	0.04
Al <sub>2</sub> O <sub>3</sub>	39.66	39.73	39.54	39.63	39.49	39.51	39.40	39.53	39.34	39.32	39.19	39.41	39.62	39.74	Al <sub>2</sub> O <sub>3</sub>	0.94	0.27
FeO*	24.03	23.83	24.11	24.21	24.39	24.21	23.88	24.11	23.88	24.86	24.02	24.03	23.71	25.15	FeO*	10.18	9.67
MnO	0.03	0.10	0.14	0.14	0.12	0.09	0.10	0.15	0.30	0.24	0.24	0.23	0.16	0.25	MnO	0.09	0.05
MgO	2.82	2.83	2.75	2.74	2.76	2.75	2.77	2.57	2.47	2.51	2.68	2.59	2.62	2.52	MgO	24.04	24.71
CaO	0.01	0.02	0.05	0.02	0.08	0.05	0.08	0.05	0.04	0.01	0.04	0.01	0.03	0.05	CaO	0.06	0.03
Na <sub>2</sub> O	0.03	0.02	0.02	0.03	0.03	0.00	0.00	0.00	0.03	0.02	0.00	0.01	0.00	0.00	Na <sub>2</sub> O	0.05	0.02
K <sub>2</sub> O	0.04	0.02	0.05	0.03	0.02	0.05	0.05	0.03	0.03	0.04	0.03	0.03	0.04	0.01	K <sub>2</sub> O	0.52	0.07
Cr <sub>2</sub> O <sub>3</sub>	0.01	0.01	0.02	0.00	0.02	0.02	0.01	0.00	0.00	0.06	0.00	0.01	0.01	0.01	Cr <sub>2</sub> O <sub>3</sub>	0.00	0.00
Total	90.56	90.35	90.89	90.99	91.11	90.88	90.41	90.34	89.68	90.97	90.22	90.30	90.30	92.17	total	94.67	95.19
Si	2.017	2.008	2.034	2.030	2.032	2.034	2.036	2.021	2.012	2.017	2.033	2.028	2.034	2.034	Cation per 5 oxygens		
Ti	0.000	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	Si	7.859	7.983
Al	3.940	3.954	3.915	3.921	3.906	3.913	3.918	3.941	3.954	3.911	3.913	3.930	3.941	3.898	Ti	0.020	0.004
Fe	1.694	1.682	1.694	1.699	1.711	1.701	1.685	1.706	1.703	1.755	1.702	1.700	1.674	1.750	Al	0.149	0.042
Mn	0.002	0.007	0.010	0.010	0.008	0.006	0.007	0.011	0.022	0.017	0.017	0.017	0.012	0.018	Fe	1.142	1.070
Mg	0.354	0.356	0.345	0.343	0.346	0.344	0.348	0.324	0.314	0.315	0.338	0.326	0.330	0.312	Mn	0.010	0.006
Ca	0.001	0.002	0.004	0.002	0.007	0.004	0.007	0.005	0.004	0.001	0.003	0.001	0.003	0.004	Mg	4.807	4.874
Na	0.005	0.003	0.002	0.005	0.005	0.000	0.000	0.000	0.005	0.004	0.000	0.002	0.000	0.000	Ca	0.009	0.005
K	0.005	0.002	0.005	0.004	0.002	0.005	0.005	0.003	0.003	0.005	0.004	0.003	0.005	0.001	Na	0.013	0.005
Cr	0.000	0.001	0.001	0.000	0.001	0.001	0.000	0.000	0.000	0.004	0.000	0.001	0.000	0.001	K	0.090	0.012
Total	8.017	8.017	8.011	8.014	8.018	8.010	8.007	8.010	8.016	8.029	8.011	8.008	7.997	8.017	Cr	0.000	0.000
*Total Fe as FeO															total	14.098	14.001
*Total Fe as FeO															*Total Fe as FeO		

in G : inclusion in garnet