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Til Gunnar Christensen
Her kan du se hvor
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SKAGEX 1990.
Preliminary results from the nutrient intercalibration.

by

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ABSTRACT
An important part of SKAGEX 1990 was the nutrient intercalibration, which was performed to simulate ordinary work at sea. 44 water samples of 0,5 liter were delivered to each of the 13 participating research vessels in Arendal harbour the morning of June 6th. The samples were sampled during the 5th of June when R/V "G. O. Sars" was working the H transect of SKAGEX. The participants should present their results before noon June 7th. From the preliminary results of the treatment of the reported data, it is demonstrated that most of the nutrient data determined during SKAGEX may be used for the purpose of SKAGEX.

INTRODUCTION
In the ICES multiship study of the Skagerrak in may - june 1990, the Skagerrak experiment - SKAGEX - (C. Res. 1989/4:1), measurements of nutrients played an important part in the synoptic survey. The Study Group on SKAGEX, (C.Res. 1989/2:28), in discussion of the nutrient measurements, expressed the need for an intercalibration between the participating ships during the field work. Although the results from the ICES nutrient intercalibration, where most of the participating laboratories had taken part, were promising, the Study Group felt that there may be clearly differences in the performance of chemical measurements during a well organized analytical scheme at a stable platform in a land-based laboratory and in a shipboard laboratory working under time pressure. The

intercalibration during SKAGEX was decided to be performed as close to normal shipboard operations as possible and was taking place in the harbor of Arendal 6th - 7th of June 1990.

MATERIALS AND METHODS

The Skagerrak experiment is presented in the "Report of the Study Group on SKAGEX", C.M. 1990/C:31, and the various transects worked are presented in Fig. 1. The norwegian research vessel "G.O. Sars" covered the western part of the area and the transect H (Fig. 2) from Lindesnes on the norwegian coast to Tyborøen at the west coast of Jutland. 15 hydrographical stations were worked in the H transect, numbered from 1 to 15 starting at the norwegian coast. Stations 1, 5, 7, 8, 11 and 15 were chosen for water sampling for the intercalibrations. The stations represented the various water-masses to be found in most of the transects worked during SKAGEX. Fig. 3 and Fig. 4 presents the salinity and temperature of the transect H the day of the calibration sampling.

Water was sampled from the standard depths, 0, 5, 10, 20, 30, 50, 75, 100, 125, 150, 200 meters and 285 m as the deepest. Two 5 liter Niskin bottles were closed at each sampling depth and the water from each depth were transferred to 10 l mixing and storage polyethylene cans with taps for easy transfer to the sub-samples.

Sub-samples, 44 in all for each participating ship, were tapped into 0,5 l polyethylene bottles marked with station number and depth, and then stored under coverage on a semi-open deck space. Of the participating SKAGEX ships, 13 were equipped for on board nutrient analyses and took part in the intercalibration in Arendal.

The sampling of the water for the intercalibration was done on the last crossing, starting at midnight from Tyborøn St. H 15 the 5th of June and ending at Lindesnes, St. H 1 at 1500 hours the same day. After docking in Arendal in the morning of the 6th of June the sub-samples for the participating ships were delivered on board at each ship. CTD data from the sampled stations and forms for plotting and reporting the data were also presented to the participants at the delivery of the samples.

The participating ships were asked to report the results before noon on the 7th of June. The results were then briefly presented and discussed at the following scientific discussion of the experiences after the half-run SKAGEX.

One set of sub-samples were analyzed as part of the ordinary nutrient measurement after sampling on board "G.O. Sars" and the results are reported as G.O. Sars, a, in table 1.

RESULTS AND DISCUSSION

All the reported data are presented in table 1. The participants were asked to report their results both as vertical station plots and plotted with drawn iso-lines for the whole transect, and in tables as well. At the brief discussion in Arendal the vertical plots from the participants were copied for "overhead" projection and the plots from the various stations and parameters were presented. The similarity of the profiles was promising. Fig. 5, 6 and 7 presents the combined results from the participating ships of the values of nitrate, phosphate and silicate in water from St. H 1.

The figures 5 to 7 show that most of the participating ships are performing within reasonably good agreement. Some ships fall clearly out of the pattern and indicate analytical problems. This is most pronounced for silicate, but both for phosphate and nitrate there are

also some analytical disturbances.

By looking at all the vertical profiles, the ships that do not perform according to the average pattern, can be removed before further calculations are done. This subjective method is certainly an easy way out, but in a preliminary treatment of the data it may well be justified.

Based on the remaining ships the average values are calculated. Each ship may then be plotted against the average value and the corresponding regression line calculated. This give a possibility to recalculate the various ships values according to the average values from the intercalibration. Examples of these plots are presented figs. 8, 9 and 10. For some ships the analytical performance on some of the nutrients indicate that their results on these parameters should not be used in SKAGEX.

The storage of the water for more than 24 hours without any conservation chemicals added, was considered as a possible problem. But, since the aim of the intercalibration exercise was to establish the relationship between the values from the participating ships, it was assumed that the water samples would behave more or less the same in all the bottles and therefor possible changes in the nutrient content due to biological activity could be ignored.

As mentioned above one set of samples was analyzed during the sampling on board "G.O. Sars". Figs. 11, 12 and 13 presents the two "G.O. Sars" set of nutrients values. Both for nitrate and silicate there is a good correlation between the values from the two separate set of analyses, and there are almost negligeable differences in the values from the two set of samples. "G.O. Sars",a, was analyzed as part of the routine work when working the transect and "G.O. Sars", b, as part of the intercalibration exercise.

Our analytical performance on phosphate determinations on board "G.O. Sars" the day of the sampling was unfortunately not satisfactorily as is clearly shown in fig. 12. During the intercalibration, however, our auto-analyzer seemed to have behaved well. As it is the values from the first set of samples, i.e. no storage, that are not consistent, there is reason to conclude that for the phosphate as well, there may have been only negligeable changes due to the storage.

Although there is a need for statistical work on the data from the intercalibration, the results so far strongly indicate that for the purpose of the SKAGEX most of the nutrient values determined during the synoptic surveys are comparable after adjustments according to a specific correction factor for each ship.

The SKAGEX intercalibration exercise have also demonstrated that this type of exercise should be conducted whenever more ships are working in the same area. This exercise has also clearly demonstrated the need for a common nutrient standard. Most of the discrepancy between the various ships seems to be due to slight differences in the standards that are used.

CONCLUSION

The SKAGEX intercalibration exercise;

- confirms that most of the nutrient data determined during SKAGEX can be used for the purpose of SKAGEX.
- demonstrates the need for a common nutrient standard.
- indicates a necessary caution in the use of nutrient data as absolute figures.

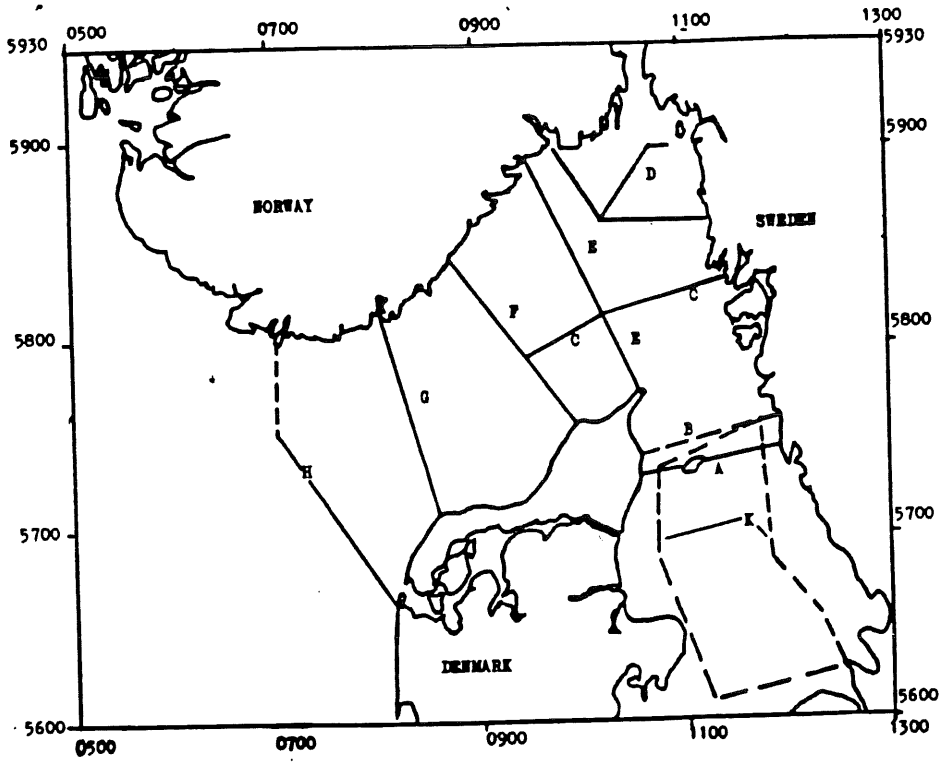

Fig. 1 Transects during SKAGEX

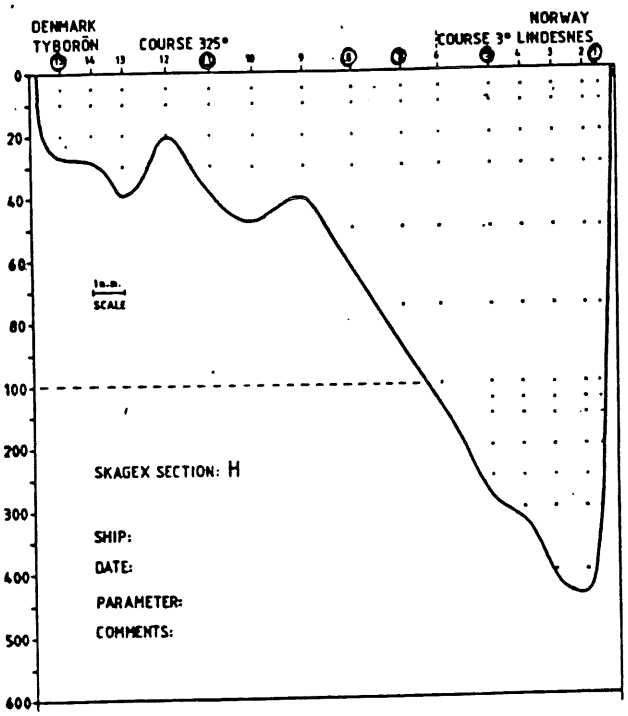

Fig. 2 The depth profile of H transect with stations and sampling depth marked. The nutrient intercalibration stations marked are St. 1, 5, 7, 8, 11 and 15.

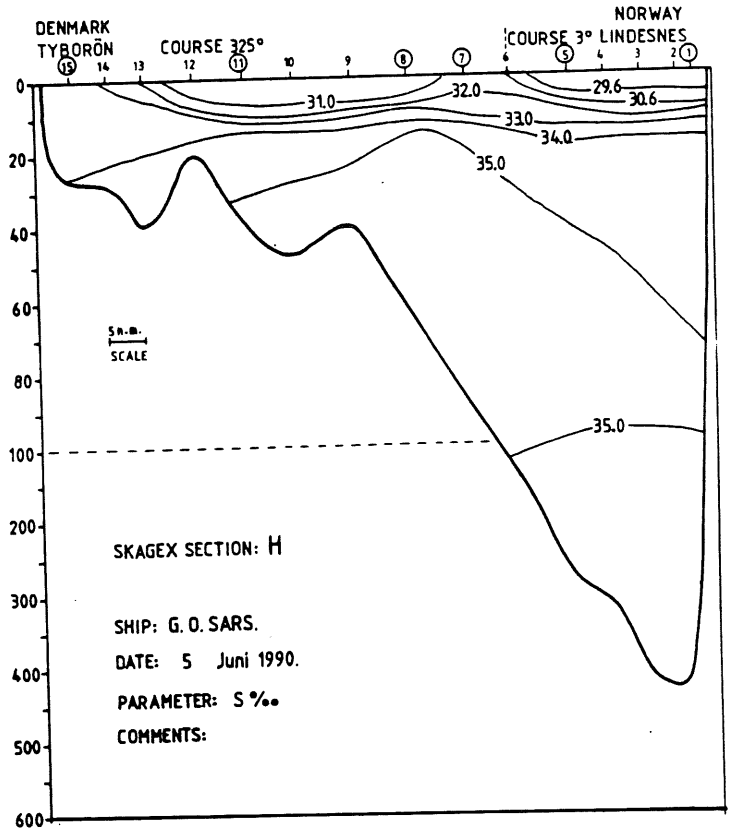

Fig. 3 The salinity distribution at H transect, June 5th 1990.

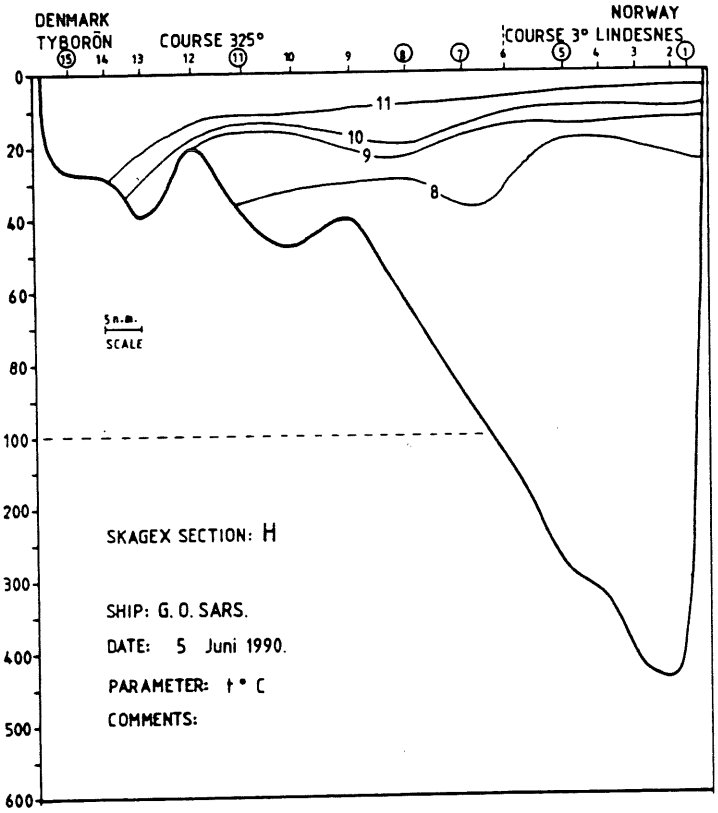

Fig. 4 The temperature distribution at H transect, June 5th 1990.

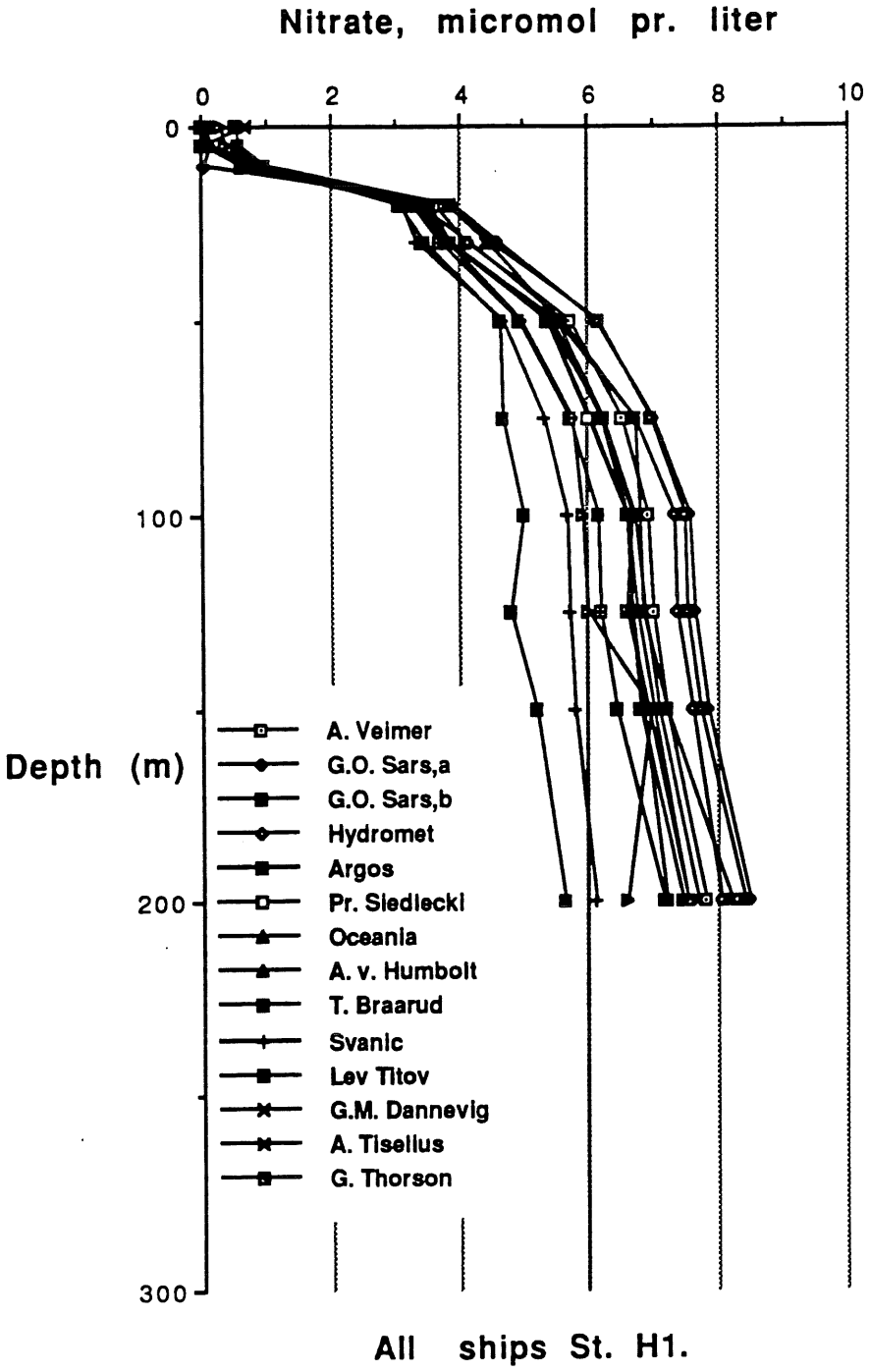

Fig. 5 The vertical profiles for nitrate (µmol NO_3 l^{-1}) values for all participating vessels of water sampled at St. H 1.

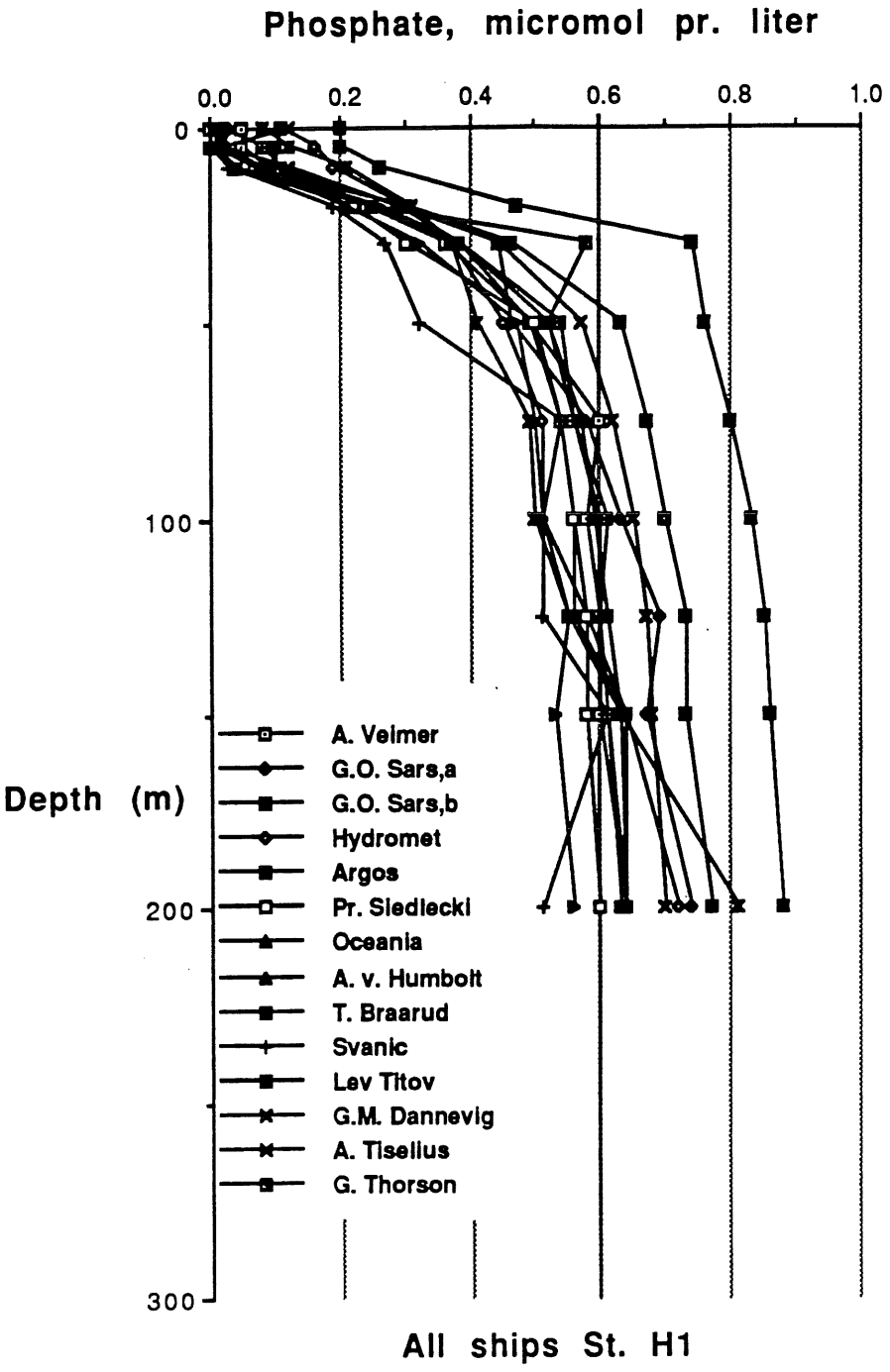

Fig. 6 The vertical profiles for phosphate (µmol PO_4 l^{-1}) values for all participating vessels of water sampled at St. H 1.

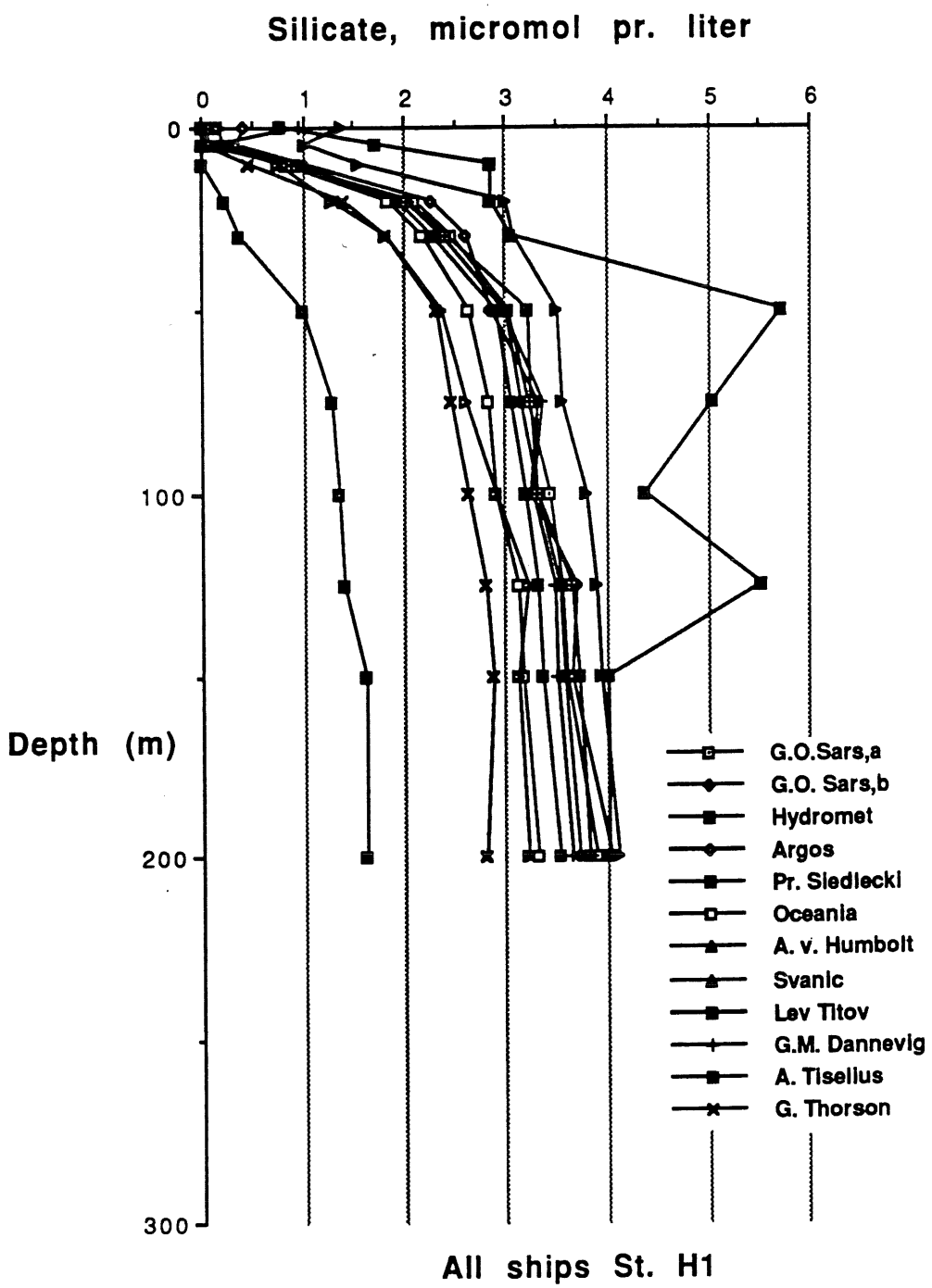

Fig. 7 The vertical profiles for silicate (µmol Si l^{-1}) values for all participating vessels of water sampled at St. H 1.

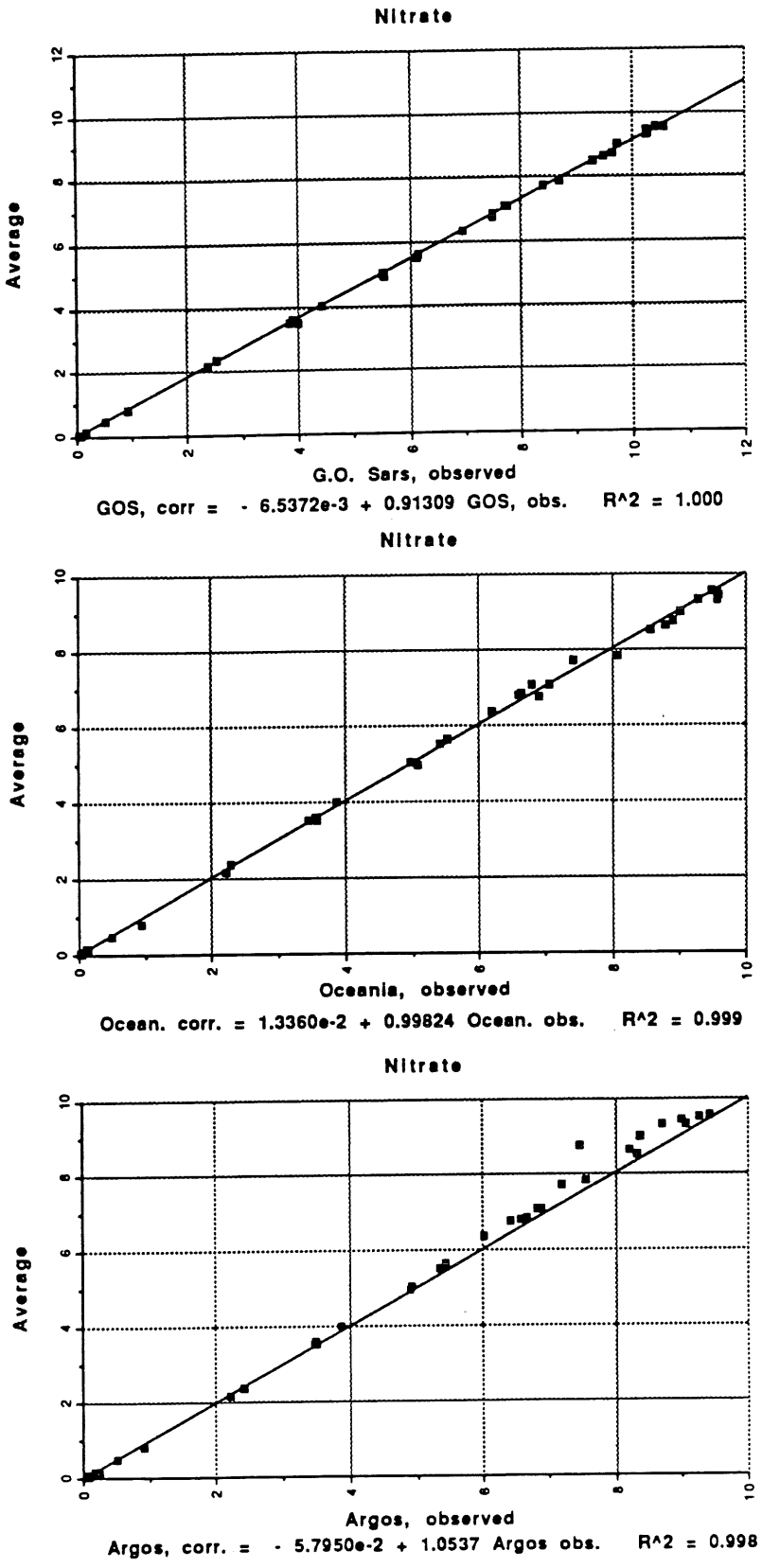

Fig. 8 Nitrate values from some vessels plotted against the selected average value.

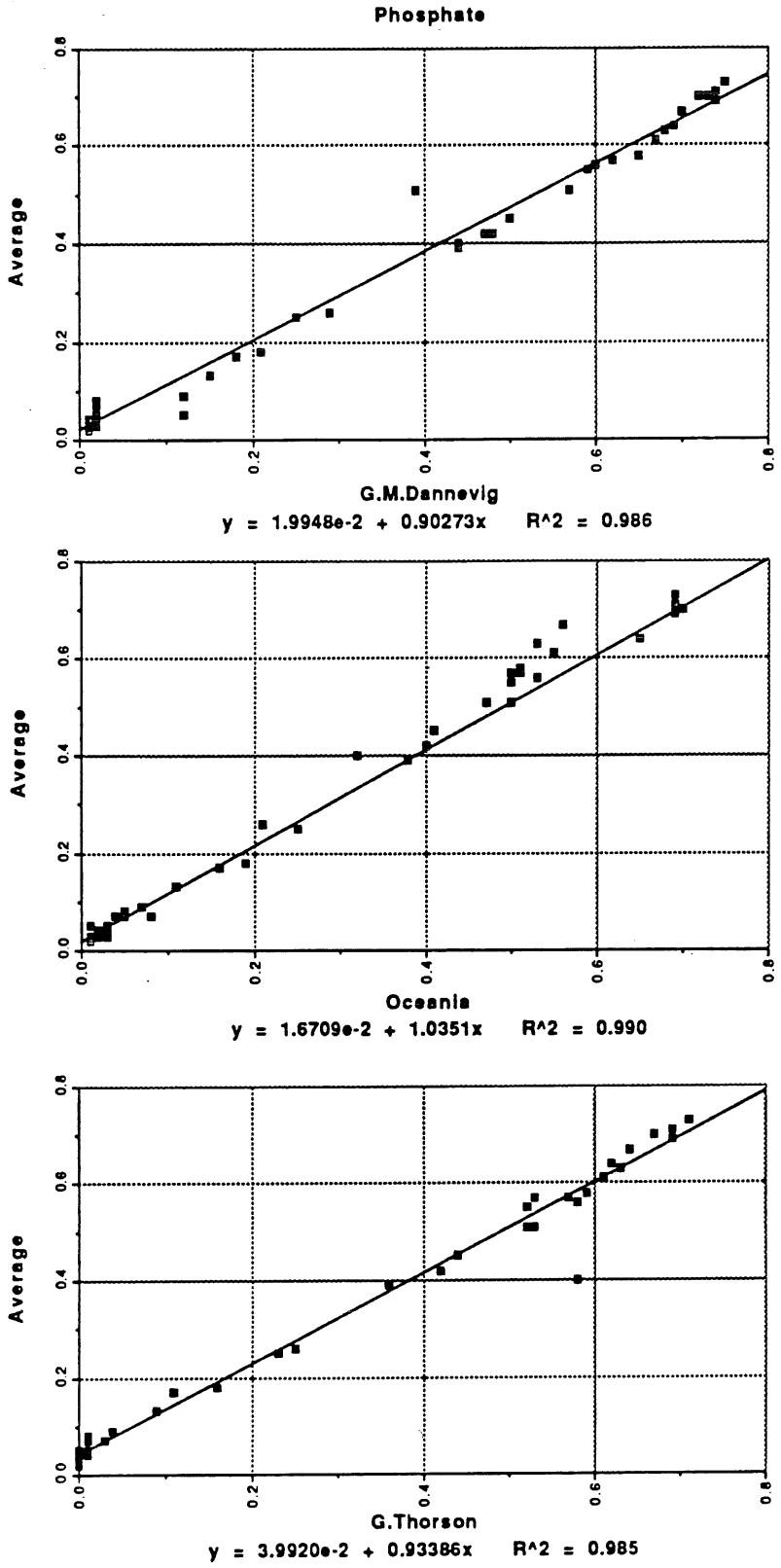

Fig. 9 Phosphate values from some vessels plotted against the selected average.

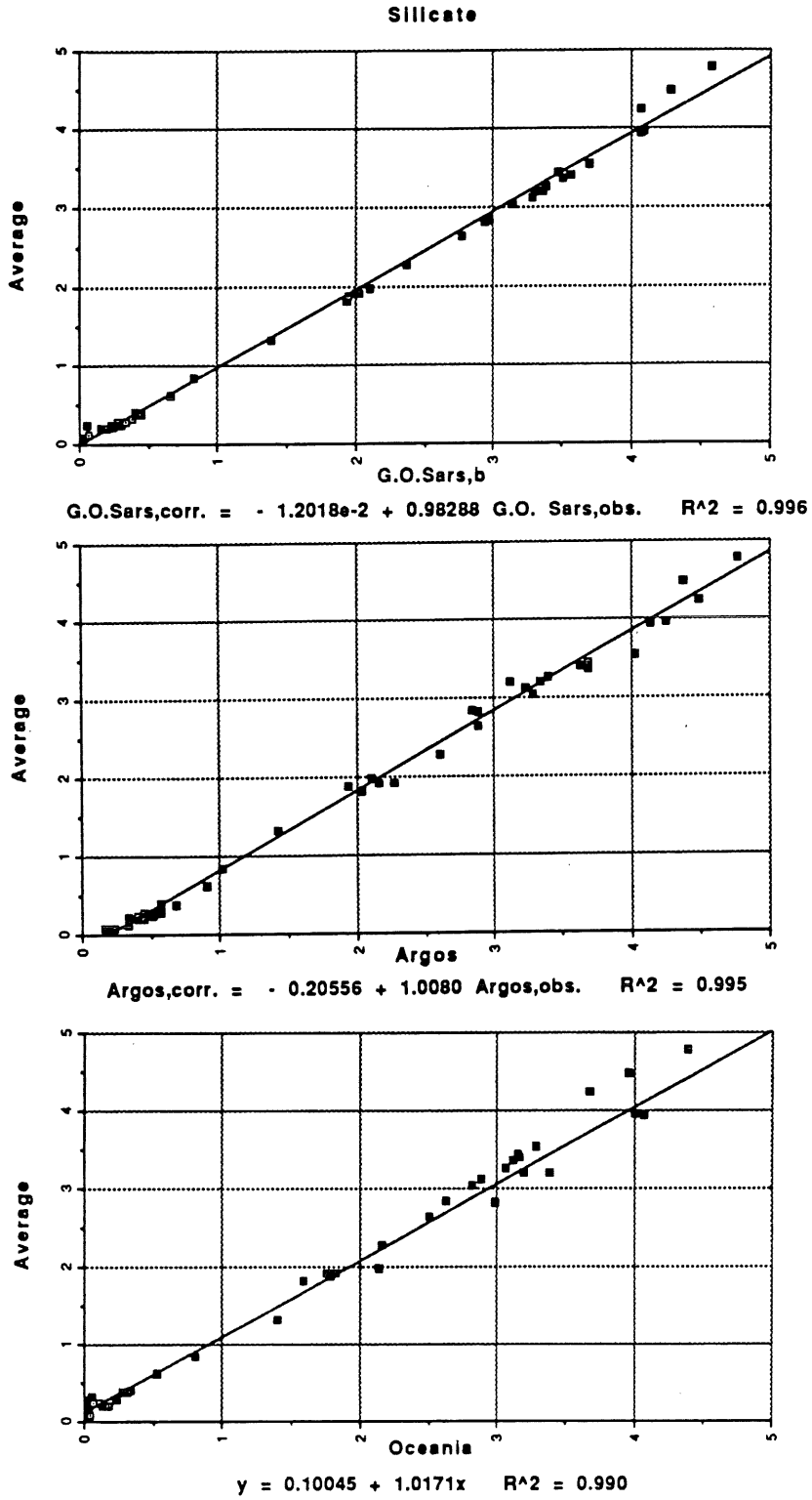

Fig. 10 Silicate values from som vessels plotted against the selected average.

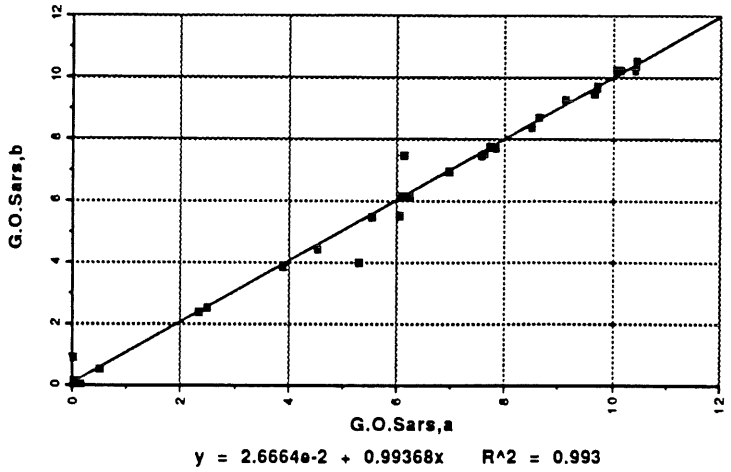

Fig. 11 Nitrate values from R/V "G.O. Sars", **a** values determined on board during the sampling, **b** values determind during the intercalibration in Arendal.

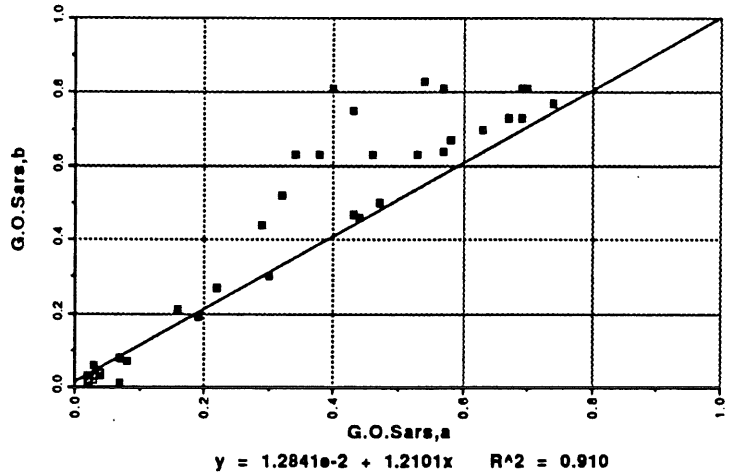

Fig. 12 Phosphate values from R/V "G.O. Sars", **a** values determined on board during the sampling, b values determined during the intercalibration in Arendal.

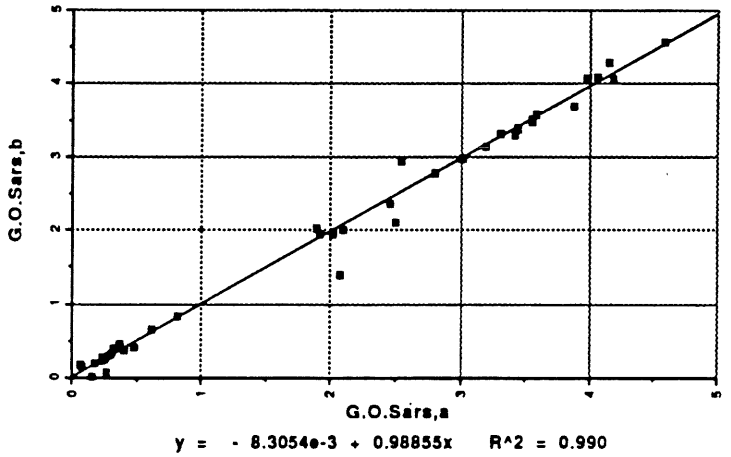

Fig. 13 Silicate values from R/V "G.O. Sars", **a** values determined on board during the sampling, **b** values determined during the intercalibration in Arendal.

Tabel 1. All the reported values from the nutrient intercalibration.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
DEPTH	A. Veimer	G.O.Sars	Hydromet	Argos	Pr.Siedlecki	Oceania	A.v.Humbolt	T.Braarud	Svanic	Lev Titov	G.M.Dannevig	A.Tiselius	G.Thorson	Average	Standard dev.
						NITRATE									
0.00	0.10	0.07	0.03	0.08	0.00	0.04	0.28	0.53	0.04	0.08	0.67	0.09	0.02	0.16	0.21
5.00	0.10	0.06	0.02	0.06	0.00	0.02	0.37	0.57	0.03	0.07	0.05	0.07	0.01	0.11	0.17
10.00	0.80	0.90	0.87	0.92	0.70	0.94	0.95	0.96	0.96	0.61	0.73	0.98	0.62	0.84	0.13
20.00	3.60	3.85	3.38	3.52	3.36	3.44	3.30	3.05	3.09	3.27	3.25	3.82	3.28	3.40	0.24
30.00	4.10	4.44	4.15	3.87	3.82	3.87	3.81	3.45	3.35	3.68	3.80	4.40	3.77	3.89	0.32
50.00	5.70	6.13	5.58	5.35	5.34	5.42	4.94	4.62	4.65	4.91	5.33	5.50	5.50	5.31	0.43
75.00	6.50	6.96	6.71	6.02	5.98	6.20	5.76	4.67	5.30	5.69	6.24	6.70	6.23	6.07	0.62
100.00	6.90	7.48	7.31	6.58	6.57	6.59	5.91	4.96	5.68	6.13	6.69	6.78	6.66	6.48	0.67
125.00	7.00	7.50	7.33	6.66	6.73	6.65	5.97	4.78	5.70	6.18	6.85	6.84	6.58	6.52	0.72
150.00	7.20	7.71	7.58	6.82	6.98	6.80	6.95	5.20	5.78	6.42	7.06	7.20	6.90	6.82	0.69
200.00	7.80	8.40	8.03	7.20	7.49	7.42	6.60	5.63	6.12	7.14	7.69	8.20	7.53	7.33	0.80
0.00	0.10	0.07	0.08	0.10	0.00	0.12	0.37	0.44	0.13	0.07	0.05	0.10	0.00	0.13	0.13
5.00	0.10	0.06	0.14	0.06	0.00	0.14	0.75	0.40	0.09	0.16	0.05	0.10	0.00	0.16	0.20
10.00	3.40	3.99	2.21	3.46	3.26	3.58	3.27	2.58	3.29	2.82	3.56	3.60	3.28	3.25	0.47
20.00	4.90	5.53	3.95	4.90	4.77	5.07	4.61	3.71	4.42	4.44	5.10	4.40	4.87	4.67	0.49
30.00	6.80	7.49	5.24	6.41	6.61	6.92	6.39	5.11	5.94	5.94	7.20	5.80	6.87	6.36	0.72
50.00	7.90	8.70	6.15	7.56	8.06	8.08	7.18	6.11	6.72	6.80	8.22	6.20	8.09	7.37	0.89
75.00	9.30	10.25	8.03	8.70	9.65	9.57	8.94	7.30	7.61	6.94	10.02	7.68	9.58	8.74	1.11
100.00	9.20	10.24	8.35	9.00	9.61	9.59	8.42	6.97	8.01	7.38	9.64	8.90	9.32	8.82	0.95
150.00	9.00	10.24		9.05	9.56	9.29	7.86	6.66	7.40	7.83	9.30	8.86	9.35	8.70	1.04
200.00	9.40	10.54		9.26	9.56	9.58	8.12	6.53	7.48	7.79	9.23	9.01	9.68	8.85	1.13
285.00	9.40	10.40		9.42	9.75	9.48	7.71	6.71	7.55	9.15	9.38	9.09	9.65	8.97	1.07
0.00	0.10	0.07	0.11	0.07	0.00	0.10	0.28	0.35	0.17	0.17	0.06	0.10	0.00	0.12	0.10
5.00	0.10	0.05	0.08	0.05	0.00	0.02	0.20	0.35	0.12	0.17	0.05	0.10	0.00	0.10	0.10
10.00	0.10	0.04	0.04	0.05	0.00	0.03	0.17	0.35	0.18	0.25	0.05	0.10	0.00	0.10	0.11
20.00	0.10	0.16	0.23	0.19	0.14	0.11	0.30	0.35	0.26	0.33	0.17	0.25	0.03	0.20	0.10
30.00	3.40	3.90	3.18	3.50	3.54	3.55	4.21	2.69	3.30	3.39	3.69	3.82	3.41	3.51	0.37
50.00	4.90	5.49	4.47	4.93	5.00	4.96	4.31	3.67	4.34	4.77	5.06	4.86	4.92	4.74	0.45
75.00	5.50	6.15	4.67	5.43	5.44	5.52	5.33	4.03	4.79	5.08	5.69	5.62	5.59	5.30	0.54
100.00	6.90	7.76	5.81	6.88	6.86	7.07	6.37	4.95	5.95	6.27	7.16	6.80	7.18	6.61	0.73
0.00	0.10	0.06	0.12	0.10	0.00	0.11	0.25	0.44	0.09	0.16	0.05	0.10	0.00	0.12	0.12
5.00	0.10	0.07	0.11	0.08	0.00	0.04	0.24	0.44	0.08	0.25	0.05	0.08	0.00	0.12	0.12
10.00	0.10	0.06	0.09	0.08	0.00	0.02	0.20	0.44	0.06	1.60	0.05	0.06	0.00	0.21	0.43
20.00	0.10	0.16	0.12	0.24	0.12	0.14	0.37	0.44	0.15	1.26	0.05	0.20	0.02	0.26	0.32
30.00	2.20	2.37	2.08	2.21	2.20	2.22	2.34	1.94	2.04	2.67	2.10	2.12	2.01	2.19	0.19
50.00	2.30	2.52	2.28	2.41	2.42	2.29	2.46	1.98	2.14	2.64	2.35	2.36	2.19	2.33	0.17
0.00	0.10	0.08	0.02	0.08	0.00	0.08	0.23	0.49	0.15	0.07	0.05	0.08	0.01	0.11	0.13
5.00	0.10	0.07	0.01	0.06	0.00	0.02	0.19	0.49	0.16	0.16	0.05	0.08	0.00	0.11	0.13
10.00	0.10	0.07	0.01	0.09	0.00	0.05	0.22	0.49	0.09	0.66	0.05	0.08	0.00	0.15	0.20
20.00	0.40	0.51	0.23	0.52	0.48	0.49	0.56	0.44	0.46	1.74	0.49	0.40	0.35	0.54	0.37
0.00	8.60	9.48	7.93	8.22	8.84	8.79	8.66	6.54	7.65	8.81	9.08	6.86	9.28	8.36	0.90
5.00	8.60	9.65	8.31	7.48	8.70	8.90	9.07	6.69	7.95	8.65	9.39	7.90	9.40	8.51	0.84
10.00	9.20	9.72	8.61	8.37	8.70	9.01	9.08	6.84	7.61	8.70	9.41	8.14	9.47	8.68	0.80
20.00	8.40	9.28	7.49	8.32	8.59	8.57	8.61	6.44	7.04	8.73	9.29	6.89	8.77	8.19	0.92
						PHOSPHATE									
0.00	0.05	0.02	0.11	0.11	0.00	0.01	0.03	0.20	0.03	0.02	0.12	0.08	0.01	0.06	0.06
5.00	0.05	0.02	0.16	0.10	0.00	0.02	0.01	0.20	0.00	0.08	0.02	0.12	0.01	0.06	0.07
10.00	0.09	0.08	0.19	0.10	0.04	0.07	0.07	0.26	0.03	0.11	0.12	0.21	0.04	0.11	0.07
20.00	0.24	0.30	0.30	0.25	0.22	0.21	0.26	0.47	0.19	0.29	0.29	0.31	0.25	0.28	0.07
30.00	0.36	0.46	0.37	0.38	0.30	0.32	0.38	0.74	0.27	0.38	0.44	0.37	0.58	0.41	0.13
50.00	0.49	0.63	0.45	0.49	0.50	0.47	0.52	0.76	0.32	0.54	0.57	0.41	0.52	0.51	0.11
75.00	0.60	0.67	0.51	0.54	0.54	0.50	0.56	0.80	0.54	0.56	0.62	0.49	0.57	0.58	0.08
100.00	0.58	0.70	0.51	0.56	0.56	0.51	0.60	0.83	0.51	0.61	0.65	0.50	0.59	0.59	0.09
125.00	0.60	0.73	0.58	0.56	0.58	0.55	0.60	0.85	0.51	0.60	0.67	0.55	0.61	0.61	0.09
150.00	0.60	0.73	0.64	0.64	0.58	0.53	0.61	0.86	0.61	0.61	0.68	0.63	0.63	0.64	0.08
200.00	0.64	0.77	0.72	0.64	0.60	0.56	0.64	0.88	0.51	0.63	0.70	0.81	0.64	0.67	0.10
0.00	0.05	0.01	0.15	0.06	0.00	0.03	0.00	0.19	0.00	0.05	0.02	0.15	0.00	0.05	0.07
5.00	0.05	0.02	0.21	0.03	0.00	0.02	0.00	0.23	0.00	0.04	0.02	0.20	0.00	0.06	0.09
10.00	0.22	0.27	0.33	0.23	0.26	0.25	0.22	0.44	0.14	0.23	0.25	0.28	0.23	0.26	0.07
20.00	0.35	0.44	0.45	0.34	0.35	0.38	0.36	0.59	0.31	0.37	0.44	0.48	0.36	0.40	0.08
30.00	0.50	0.63	0.60	0.49	0.51	0.53	0.52	0.77	0.39	0.54	0.60	0.60	0.58	0.56	0.09
50.00	0.58	0.75	0.70	0.55	0.58	0.65	0.60	0.88	0.50	0.65	0.69	0.68	0.62	0.65	0.10
75.00	0.64	0.81	0.67	0.58	0.68	0.69	0.65	0.94	0.57	0.66	0.74	0.72	0.69	0.70	0.10
100.00	0.64	0.81	0.76	0.63	0.68	0.69	0.64	0.94	0.59	0.74	0.72	0.78	0.67	0.71	0.09
150.00	0.64	0.81		0.58	0.70	0.70	0.65	0.93	0.59	0.66	0.73	0.79	0.67	0.70	0.10
200.00	0.63	0.81		0.60	0.69	0.69	0.65	0.94	0.62	0.67	0.74	0.81	0.69	0.71	0.10
285.00	0.68	0.83		0.64	0.70	0.69	0.68	0.96		0.72	0.75	0.83	0.71	0.74	0.09

Tabel 1 continued

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
0.00	0.05	0.02	0.11	0.06	0.00	0.03	0.00	0.23	0.01	0.01	0.02	0.09	0.00	0.05	0.06
5.00	0.05	0.02	0.13	0.05	0.00	0.01	0.00	0.23	0.00	0.01	0.01	0.13	0.00	0.05	0.07
10.00	0.06	0.02	0.14	0.08	0.03	0.03	0.00	0.25	0.00	0.01	0.02	0.16	0.00	0.06	0.08
20.00	0.13	0.19	0.23	0.18	0.16	0.16	0.14	0.40	0.07	0.07	0.18	0.26	0.11	0.18	0.09
30.00	0.43	0.52	0.47	0.41	0.43	0.41	0.43	0.69	0.43	0.38	0.50	0.49	0.44	0.46	0.08
50.00	0.52	0.63	0.49	0.52	0.52	0.50	0.53	0.80	0.36	0.41	0.39	0.49	0.53	0.51	0.11
75.00	0.52	0.63	0.57	0.52	0.54	0.50	0.51	0.79	0.38	0.44	0.59	0.56	0.52	0.54	0.10
100.00	0.58	0.64	0.52	0.55	0.53	0.51	0.53	0.80	0.43	0.50	0.62	0.58	0.53	0.56	0.09
0.00	0.05	0.03	0.02	0.02	0.07	0.03	0.01	0.21	0.01	0.01	0.01	0.03	0.00	0.04	0.05
5.00	0.05	0.03	0.06	0.09	0.01	0.02	0.00	0.22	0.00	0.01	0.01	0.07	0.00	0.04	0.06
10.00	0.06	0.03	0.05	0.06	0.01	0.03	0.00	0.24	0.00	0.04	0.01	0.04	0.00	0.04	0.06
20.00	0.11	0.14	0.15	0.11	0.14	0.11	0.12	0.39	0.12	0.22	0.15	0.17	0.09	0.16	0.08
30.00	0.40	0.47	0.36	0.40	0.43	0.40	0.42	0.68	0.36	0.44	0.47	0.38	0.42	0.43	0.08
50.00	0.43	0.50	0.38	0.36	0.42	0.40	0.43	0.69	0.32	0.40	0.48	0.39	0.42	0.43	0.09
0.00	0.05	0.01	0.10	0.03	0.00	0.02	0.01	0.22	0.01	0.01	0.01	0.09	0.00	0.04	0.06
5.00	0.05	0.02	0.04	0.02	0.01	0.01	0.00	0.23	0.01	0.01	0.01	0.03	0.00	0.03	0.06
10.00	0.06	0.03	0.14	0.02	0.02	0.02	0.02	0.25	0.01	0.01	0.02	0.16	0.00	0.06	0.08
20.00	0.17	0.21	0.18	0.14	0.18	0.19	0.18	0.43	0.09	0.11	0.21	0.18	0.16	0.19	0.08
0.00	0.05	0.07	0.21	0.06	0.04	0.08	0.03	0.29	0.00	0.04	0.02	0.24	0.01	0.09	0.09
5.00	0.06	0.07	0.19	0.09	0.05	0.04	0.02	0.27	0.03	0.02	0.02	0.20	0.01	0.08	0.08
10.00	0.08	0.04	0.27	0.02	0.04	0.05	0.02	0.26	0.03	0.01	0.02	0.29	0.03	0.09	0.11
20.00	0.12	0.06	0.36	0.05	0.03	0.05	0.02	0.26	0.03	0.02	0.02	0.33	0.01	0.10	0.13
						SILICATE									
0.00		0.06	0.01	0.40	0.14	0.05	1.38		0.17	0.76	0.96	0.05	0.00	0.36	0.47
5.00		0.07	0.01	0.34	0.22	0.03	1.02		0.19	1.71	0.13	0.05	0.00	0.34	0.54
10.00		0.83	0.01	1.02	0.91	0.81	1.55		0.75	2.85	0.90	0.90	0.46	1.00	0.72
20.00		2.00	0.21	2.27	1.93	1.82	2.98		1.27	2.85	1.99	2.02	1.40	1.89	0.76
30.00		2.37	0.36	2.61	2.27	2.16	3.05		1.80	3.04	2.36	2.40	1.80	2.20	0.74
50.00		2.98	0.99	2.84	2.90	2.63	3.49		2.35	5.70	2.96	3.20	2.31	2.94	1.12
75.00		3.14	1.28	3.29	3.03	2.82	3.54		2.60	5.04	3.36	3.24	2.45	3.07	0.90
100.00		3.29	1.36	3.23	3.19	2.89	3.78		2.88	4.37	3.26	3.29	2.62	3.11	0.74
125.00		3.51	1.40	3.69	3.29	3.12	3.88		3.21	5.51	3.47	3.63	2.79	3.41	0.97
150.00		3.57	1.61	3.63	3.35	3.16	3.93		3.10	3.99	3.50	3.70	2.86	3.31	0.66
200.00		3.70	1.62	4.03	3.51	3.29	4.09		3.21	3.99	3.64	3.80	2.79	3.42	0.72
0.00		0.02	0.00	0.23	0.11	0.05	1.45		0.14	1.04	0.10	0.05	0.00	0.29	0.49
5.00		0.03	0.00	0.17	0.11	0.03	1.24		0.11	0.86	0.10	0.05	0.00	0.25	0.41
10.00		1.39	0.15	1.42	1.42	1.40	2.22		1.30	3.90	1.34	1.52	0.84	1.54	0.93
20.00		2.10	0.13	2.10	1.99	2.14	2.94		1.79	3.70	2.04	2.02	1.45	2.04	0.87
30.00		2.94	0.53	2.89	2.79	2.99	3.61		2.38	3.42	2.84	2.92	2.28	2.69	0.81
50.00		3.31	0.73	3.34	3.13	3.39	3.84		2.71	4.94	3.20	3.56	2.55	3.15	1.02
75.00		4.09	1.14	4.25	3.92	4.01	4.50		3.16	5.04	3.99	4.18	3.31	3.78	1.01
100.00		4.07	0.70	4.14	3.88	4.07	4.38		3.43	3.70	3.96	4.18	3.28	3.62	1.02
150.00		4.07		4.48	3.98	3.68	4.64		3.40	3.80	3.97	6.21	3.28	4.15	0.84
200.00		4.28		4.37	4.11	3.96	4.97		3.43	5.42	4.20	6.90	3.55	4.52	1.03
285.00		4.57		4.76	4.42	4.39	5.29		3.85	5.22	4.52	6.96	3.86	4.78	0.90
0.00		0.24	0.00	0.51	0.31	0.11	1.33		0.33	2.09	0.24	0.32	0.00	0.50	0.64
5.00		0.25	0.00	0.40	0.33	0.07	1.14		0.36	2.09	0.26	0.35	0.00	0.48	0.62
10.00		0.38	0.00	0.57	0.50	0.06	1.10		0.77	3.32	0.40	0.38	0.00	0.68	0.94
20.00		1.95	0.50	1.93	1.99	1.79	2.69		1.44	5.89	1.98	2.03	1.39	2.14	1.36
30.00		2.77	1.17	2.89	2.69	2.51	3.26		1.94	3.70	2.76	2.82	2.08	2.60	0.68
50.00		3.37	1.63	3.12	3.32	3.20	3.75		2.74	6.27	3.40	3.40	2.67	3.35	1.12
75.00		3.39	1.66	3.40	3.33	3.07	3.81		2.96	4.56	3.39	3.56	2.68	3.26	0.72
100.00		3.48	1.75	3.69	3.43	3.15	3.68		3.02	5.60	3.47	4.01	2.80	3.46	0.93
0.00		0.33	0.00	0.51	0.40	0.04	1.39		0.47	0.28	0.33	0.33	0.00	0.37	0.38
5.00		0.32	0.00	0.45	0.39	0.06	1.16		0.41	2.09	0.33	0.33	0.00	0.50	0.61
10.00		0.25	0.00	0.34	0.33	0.05	0.98		0.47	0.28	0.27	0.32	0.00	0.30	0.27
20.00		0.30	0.01	0.45	0.35	0.05	1.14		0.47	0.95	0.31	0.32	0.00	0.40	0.36
30.00		1.94	0.38	2.04	1.85	1.59	2.44		1.44	2.85	1.91	2.10	1.29	1.80	0.64
50.00		2.02	0.53	2.16	1.95	1.76	2.54		1.91	2.85	2.01	2.12	1.35	1.93	0.60
0.00		0.17	0.00	0.45	0.24	0.18	0.84		0.50	0.66	0.18	0.20	0.00	0.31	0.27
5.00		0.16	0.00	0.40	0.22	0.14	0.73		0.39	0.57	0.18	0.21	0.00	0.27	0.23
10.00		0.20	0.00	0.45	0.26	0.13	0.80		0.39	0.86	0.22	0.21	0.00	0.32	0.29
20.00		0.66	0.02	0.91	0.67	0.53	1.29		1.30	1.42	0.67	0.82	0.11	0.76	0.46
0.00		0.41	0.00	0.68	0.43	0.28	1.59		0.42	0.48	0.36	0.51	0.00	0.47	0.42
5.00		0.45	0.00	0.57	0.43	0.31	1.51		0.03	0.10	0.40	0.52	0.00	0.39	0.43
10.00		0.40	0.00	0.57	0.52	0.34	1.31		0.03	0.57	0.40	0.50	0.00	0.42	0.37
20.00		0.28	0.00	0.57	0.35	0.24	1.27		0.00	0.38	0.30	0.30	0.00	0.34	0.36