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Nitrate_plus_Nitrite:Bottle

Precision statement for replicate samples drawn from a single Niskin bottle:

The pooled standard deviation for Nitrate_plus_Nitrite:Bottle for the range 10.0 to 44.9 $\mu\text{mol/l}$ was 0.07, $k = 18$ (0 outlier removed) where k is the number of pairs of duplicates.

The pooled standard deviation of pairs of samples (S_p) was calculated by:

$$S_p = \text{SQRT}\{\text{sum}(d^2)/2k\}$$

where k is the number of pairs and d is the difference between pairs.

Accuracy of the stock standard batch was determined by using commercially available standards from WAKO Chemicals (Sagami Chemical Company of Japan).

The values were within 0.99 % of the 20 $\mu\text{mol/l}$ Nitrate Standard.

Accuracy was also determined by using commercially available standards from Kanso (Environmental Technos Co. Ltd, Japan). Kanso Lot AV-0861.

When this standard was run as an unknown, nitrate values were within 0.01 %.

Nitrate data from 1000 to 4000 m agree with results averaged over 16 profiles at P26 from 1995 to 2001 to within 0.55 %.

August 2007 stock standard solutions were used for this cruise analyses.

Duplicate samples from a single Niskin bottle

Event Number	Sample Number	Station	Pressure dbar	Nitrate 1 $\mu\text{mol/l}$	Nitrate 2 $\mu\text{mol/l}$	Rejected yes / no	Comment
1	3	SI03	175.9	12.3	12.4		
3	14	P2	100.2	23.9	24.0		
6	39	P4	16.9	10.1	10.0		
12	65	P4	800.5	44.1	44.1		
18	89	P8	798.3	44.6	44.6		
24	134	P12	1000.5	44.9	44.7		
31	195	P16	6.1	12.7	12.5		
35	226	P16	602.6	44.4	44.2		
37	247	P20	202.2	29.1	29.3		
40	277	P20	397.4	41.5	41.5		
45	314	P26	24.7	16.0	16.0		
46	344	P26	151.6	33.3	33.2		
51	377	PA-001	43.7	15.5	15.7		
56	416	M2	100.0	19.8	19.6		
57	430	M3	50.3	21.3	21.3		
58	436	M4	349.7	27.7	27.7		
61	468	Ri1	24.9	20.6	20.6		
74	497	Ri4	25.3	20.0	20.1		

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Phosphate:Bottle

Precision statement for replicate samples drawn from a single Niskin bottle:

The pooled standard deviation for Phosphate:Bottle for the range 1.11 to 4.72 $\mu\text{mol/l}$ was 0.030,
 $k = 18$ (0 outlier removed) where k is the number of pairs of duplicates.

The pooled standard deviation of pairs of samples (S_p) was calculated by:

$$S_p = \text{SQRT}\{\text{sum}(d^2)/2k\}$$

where k is the number of pairs and d is the difference between pairs.

Accuracy was determined by using commercially available standards from Kanto
(Environmental Technos Co. Ltd, Japan). Kanto Lot AV-0861.

When this standard was run as an unknown, phosphate values were within 0.00%.

Phosphate data from 1000 to 4000 m agree with results averaged over 16 profiles at P26 from 1995 to 2001
to within 0.01 %.

August 2007 stock standard solutions were used for this cruise analyses.

Duplicate samples from a single Niskin bottle

Event Number	Sample Number	Station	Pressure dbar	Phosphate 1 $\mu\text{mol/l}$	Phosphate 2 $\mu\text{mol/l}$	Rejected yes / no	Comment
1	3	SI03	175.9	4.72	4.72		
3	14	P2	100.2	1.90	1.91		
6	39	P4	16.9	1.12	1.11		
12	65	P4	800.5	3.26	3.28		
18	89	P8	798.3	3.28	3.27		
24	134	P12	1000.5	3.28	3.28		
31	195	P16	6.1	1.22	1.22		
35	226	P16	602.6	3.14	3.14		
37	247	P20	202.2	2.15	2.15		
40	277	P20	397.4	2.95	3.13		
45	314	P26	24.7	1.45	1.44		
46	344	P26	151.6	2.42	2.44		
51	377	PA-001	43.7	1.43	1.43		
56	416	M2	100.0	1.71	1.71		
57	430	M3	50.3	1.82	1.82		
58	436	M4	349.7	2.35	2.35		
61	468	Ri1	24.9	1.78	1.79		
74	497	Ri4	25.3	1.75	1.75		

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Silicate:Bottle

Precision statement for replicate samples drawn from a single Niskin bottle:

The pooled standard deviation for Silicate:Bottle for the range 12.8 to 137.9 $\mu\text{mol/l}$ was 0.31,
k = 18 (0 outliers removed) where k is the number of pairs of duplicates.

The pooled standard deviation of pairs of samples (S_p) was calculated by:

$$S_p = \text{SQRT}\{\text{sum}(d^2)/2k\}$$

where k is the number of pairs and d is the difference between pairs.

Accuracy of the stock standard batch was determined by using commercially available standards from
WAKO Chemicals (Sagami Chemical Company of Japan).

The values were within 0.40 % of the 100 $\mu\text{mol/l}$ Silicate Standard.

Accuracy was also determined by using commercially available standards from Kanso
(Environmental Technos Co. Ltd, Japan). Kanso Lot AV-0861.

When this standard was run as an unknown, silicate values were within 0.09%.

Silicate data from 1000 to 4000 m agree with results averaged over 16 profiles at P26 from 1995 to 2001 to within 1.06 %.

August 2007 stock standard solutions were used for this cruise analyses.

Duplicate samples from a single Niskin bottle

Event Number	Sample Number	Station	Pressure dbar	Silicate 1 $\mu\text{mol/l}$	Silicate 2 $\mu\text{mol/l}$	Rejected yes / no	Comment
1	3	SI03	175.9	90.8	90.3		
3	14	P2	100.2	32.0	32.0		
6	39	P4	16.9	12.8	12.8		
12	65	P4	800.5	116.1	116.4		
18	89	P8	798.3	121.1	122.4		
24	134	P12	1000.5	137.9	137.5		
31	195	P16	6.1	15.6	15.7		
35	226	P16	602.6	118.8	118.4		
37	247	P20	202.2	51.8	52.2		
40	277	P20	397.4	91.0	90.1		
45	314	P26	24.7	23.8	23.7		
46	344	P26	151.6	61.2	61.5		
51	377	PA-001	43.7	24.3	24.2		
56	416	M2	100.0	34.0	34.3		
57	430	M3	50.3	39.6	39.6		
58	436	M4	349.7	54.6	54.5		
61	468	Ri1	24.9	38.1	38.1		
74	497	Ri4	25.3	36.9	36.9		

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Nitrate_plus_Nitrite:Bottle

Precision statement for samples drawn from duplicate Niskin bottles closed at same pressure:

The pooled standard deviation for Nitrate_plus_Nitrite:Bottle for the range 15.5 to 45.2 $\mu\text{mol/l}$ was 0.14,
k = 8 (0 outlier removed) where k is the number of pairs of duplicates.

The pooled standard deviation of pairs of samples (S_p) was calculated by:

$$S_p = \text{SQRT}\{\text{sum}(d^2)/2k\}$$

where k is the number of pairs and d is the difference between pairs.

Duplicate Niskins at the same pressure

Event Number	Sample Number	Station	Nominal Pressure dbar	Nitrate 1 $\mu\text{mol/l}$	Nitrate 2 $\mu\text{mol/l}$	Rejected yes / no	Comment
3	15 / 16	P2	75	17.6	17.6		
12	63 / 64	P4	1000	44.6	44.4		
18	87 / 88	P8	1000	45.1	45.2		
24	131 / 132	P12	1500	44.0	44.1		
35	217 / 218	P16	3500	39.2	39.7		
40	269 / 270	P20	2500	41.4	41.4		
51	380 / 381	PA-001	30	15.6	15.5		
51	386 / 387	PA-001	5	15.5	15.5		

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Phosphate:Bottle

Precision statement for samples drawn from duplicate Niskin bottles closed at same pressure:

The pooled standard deviation for Phosphate:Bottle for the range 1.42 to 3.31 $\mu\text{mol/l}$ was 0.032,
 $k = 8$ (0 outlier removed) where k is the number of pairs of duplicates.

The pooled standard deviation of pairs of samples (S_p) was calculated by:

$$S_p = \text{SQRT}\{\text{sum}(d^2)/2k\}$$

where k is the number of pairs and d is the difference between pairs.

Duplicate Niskins at the same pressure

Event Number	Sample Number	Station	Nominal Pressure dbar	Phosphate 1 $\mu\text{mol/l}$	Phosphate 2 $\mu\text{mol/l}$	Rejected yes / no	Comment
3	15 / 16	P2	75	1.50	1.51		
12	63 / 64	P4	1000	3.30	3.31		
18	87 / 88	P8	1000	3.28	3.28		
24	131 / 132	P12	1500	3.19	3.20		
35	217 / 218	P16	3500	2.77	2.77		
40	269 / 270	P20	2500	2.94	2.82		
51	380 / 381	PA-001	30	1.42	1.43		
51	386 / 387	PA-001	5	1.45	1.44		

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Silicate:Bottle

Precision statement for samples drawn from duplicate Niskin bottles closed at same pressure:

The pooled standard deviation for Silicate:Bottle for the range 22.0 to 178.4 $\mu\text{mol/l}$ was 0.45,
 $k = 8$ (0 outlier removed) where k is the number of pairs of duplicates.

The pooled standard deviation of pairs of samples (S_p) was calculated by:

$$S_p = \text{SQRT}\{\text{sum}(d^2)/2k\}$$

where k is the number of pairs and d is the difference between pairs.

Duplicate Niskins at the same pressure

Event Number	Sample Number	Station	Nominal Pressure dbar	Silicate 1 $\mu\text{mol/l}$	Silicate 2 $\mu\text{mol/l}$	Rejected yes / no	Comment
3	15 / 16	P2	75	22.4	22.0		
12	63 / 64	P4	1000	134.2	133.8		
18	87 / 88	P8	1000	138.0	137.9		
24	131 / 132	P12	1500	164.4	164.6		
35	217 / 218	P16	3500	178.4	177.6		
40	269 / 270	P20	2500	174.9	173.6		
51	380 / 381	PA-001	30	23.9	24.4		
51	386 / 387	PA-001	5	24.6	24.2		