

Cruise: SKO1406
Ship: Skogafoss
Expocode: AGFO20140607
Dates: June 20th – June 28th, 2014
Chief Scientist: Christopher Taylor
Equipment: TSG-Underway
Total number of stations: 33
Location: North atlantic transect

The samples were run as part of our ocean acidification monitoring project.

Sample Collection

The discrete samples were collected from the TSG underway (UW) system onboard the ship by Christopher Taylor. The date and time listed in the data file are UTC when each sample bottle was collected.

DIC:

33 locations, 33 samples each 500-ml, no duplicate samples.
Sample_ID#: 10000, etc.; Sample bottle number, no Niskin or cast number
PI: Dr. Rik Wanninkhof
Analyzed by: Charles Featherstone

pH:

33 locations, 33 samples each 500-ml, no duplicate samples.
Sample_ID#: 10000, etc.; Sample bottle number, no Niskin or cast number
PI: Dr. Rik Wanninkhof
Analyzed by: Charles Featherstone

TAlk:

33 locations, 33 samples each 500-ml, no duplicate samples.
Sample_ID#: 10000, etc.; Sample bottle number, no Niskin or cast number
PI: Dr. Rik Wanninkhof
Analyzed by: Leticia Barbero and Denis Pierrot

Sample Analysis

DIC:

Instrument ID	Date	Certified CRM ($\mu\text{mol/kg}$)	CRM Value ($\mu\text{mol/kg}$)	CRM Offset ($\mu\text{mol/kg}$)	Blank (Counts)	Avg. Sample Analysis Time
AOML 2	07/17/14	2016.65	2018.57	1.92	13.7	8
AOML 2	07/18/14	2016.65	2018.40	1.75	12.0	8

Analysis date: 07/17/2104
Coulometer used: SOMMA –AOML 2
Blanks: 13.7 counts/min
CRM # 0967 was used and with an assigned value of (includes both DIC and salinity):
Batch 129, c: 2016.65 $\mu\text{mol/kg}$, S: 33.361
CRM values measured: AOML 2: offset 1.92 $\mu\text{mol/kg}$ (2018.57 $\mu\text{mol/kg}$).
Average run time, minimum run time, maximum run time: 8, 8 and 8 min.

Analysis date: 07/18/2104
Coulometer used: SOMMA –AOML 2
Blanks: 12.0 counts/min
CRM # 0090 was used and with an assigned value of (includes both DIC and salinity):
Batch 129, c: 2016.65 $\mu\text{mol/kg}$, S: 33.361
CRM values measured: AOML 2: offset 1.75 $\mu\text{mol/kg}$ (2018.40 $\mu\text{mol/kg}$).
Average run time, minimum run time, maximum run time: 8, 8 and 8 min.

Reproducibility: (# samples and average difference): No duplicate samples were collected.

CRM, salinity and HgCl_2 correction applied: Salinity correction was applied using TSG salinity.

Remarks

The volume correction was applied due to added HgCl_2 (Measured DIC*1.00037).
The first CRM of each cell was used for a CRM correction.

The DIC instrument was stable: CRM values did not change significantly throughout the life span of each cell.

pH:

Analysis date: July 17th and 18th, 2014
Spectrophotometer used: HP Agilent 8453

Reproducibility: (# samples and average difference): No duplicates were collected.

Remarks

The equations of Liu et al, 2011 formulated using the purified m-cresol purple indicator was used to determine pH of the samples. pH samples were analyzed at 20⁰C at Full Scale (pH 0-14).

Temperature for each sample was measured before analysis using a Hart Scientific Fluke

1523 reference thermometer.

Approximately 80 mL of sample was extracted from each DIC sample bottle by syringe before DIC analysis to determine the pH.

Talk:

The results posted are analyses from the same sample bottles used for DIC.

Analysis date: 08/05/2014 – 08/06/2014

Titration system used: Open cell

CRM analysis (values in $\mu\text{mol/kg}$):

CRM analyzed:

Batch 123, Salinity = 33.384, cert. TA = 2225.21 $\mu\text{mol/kg}$.

2 CRM samples were run daily on each cell, before (CRM-1) and after (CRM-2) the seawater samples. The TA for the water samples was corrected using the daily averaged ratios between the certified and measured values of the 2 CRMs run on each cell. The following table shows the CRM measurements for each day and cell.

CRM	Date	Batch	Bottle #	SYSTEM 1			meas.-cert. TA	SYST EM 2 meas.- cert. TA	Diff. in Offsets
				meas. TA	meas.-cert. TA	Diff. in Offsets			
1	08/05/14	123	10	2223.51	-1.7	0.89	2214.09	-11.12	3.41
2	08/05/14	123	505	2222.62	-2.59		2210.68	-14.53	
1	08/06/14	123	787	2220.04	-5.17	0.56	2215.29	-9.92	1051 was not used in the calculations
2	08/06/14	123	1051	2220.60	-4.61		2208.08	-17.13	

Reproducibility: No duplicates were collected.

Remarks

System 1 behaved well during the analyses. System 2 was more inconsistent. On August 6th, the value for the second CRM used on system 2 was considered suspicious based on the normal values obtained for CRMs from batch 123 and was not used for the correction of the few samples run on system 2 on that day.

The CRM measurement for each day was used to correct the data for that day only.

Comments

Sample ID # is the sample bottle number. No station or niskin bottle numbers with underway sampling. The latitude, longitude, date, and time reported with the DIC, pH and TAlk measurements were taken from the sample field log. The field log values are provided for reference; no post-cruise assurance of accuracy has been done to this data.

UPDATE:

Between March and June of 2021, all of the data for the discrete samples was put into a uniform format. The supporting information was checked for accuracy, especially the expocode, date, time, and positions.

Additionally, pH results were recalculated to 20 and 25 degrees Celsius.