2009-03

CCGS *JP Tully*

Dimethylsulfide (DMS) & Dimethylsulfoniopropionate (DMSP) Report

January 28- February 9, 2009

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1. Sample Collection

Samples were collected from all major stations (P4, P12, P16, P20, P26) for DMS, $DMSP_{D\ (dissolved)}$ & $DMSP_{T\ (total)}$.

1.1 DMS

Thirteen water samples from various depths (200m, 175m, 100m, 75m, 50m, 40m, 30m, 25m, 20m, 15m, 10m, 5m, surface) were collected at each station in 250mL ground glass stoppered bottles. The only exception to this was P26 where, due to weather and time constraints, only 9 samples were collected (no samples deeper than 50m). Samples were stored in the dark and removed one at a time before analysis.

1.2 DMSP

Six samples for both $DMSP_D$ and $DMSP_T$ were collected at each station; two at the surface (0m, 5m), one in the mixed layer (100m), one in the deep chlorophyll max (20m) and two in the salinity mix layer (175m, 200m).

2. Analysis

2.1 DMS

A sample was loaded onto the stripper and purged with UHP Nitrogen for 10 minutes at ~100mL/min. The DMS was extracted from the water and absorbed onto a Tenax TA trap kept at -80^{o}C. The trap was subsequently desorbed at 100^{o}C (with a dewar containing boiling water) onto a Chromasorb 330 column which eluted onto a Flame Photometric Detector (FPD). All samples were run immediately after being collected.

2.2 $DMSP_D$

Approximately 50-100mL of seawater was allowed to flow directly from the niskin into a filtration funnel containing a 0.7μm GF/F filter. The first 3.5mL was collected in a polypropylene tube (15mL) containing 50μL of a 50% sulphuric acid solution. The sample was stored for 24 hours in the dark and at 4˚C after which time 3mL was transferred to a 25mL serum bottle containing 21mL of MQ water. An additional 1mL of a 5 Molar solution of sodium hydroxide was added to the bottle before it was crimped and sealed. The bottle was stored in the dark and at 4˚C.'

2.3 $DMSP_T$

3.5mL of seawater was collected directly from the niskin into a polypropylene tube (15mL) containing 50µL of a 50% sulphuric acid solution. The sample was stored for 24 hours in the dark and at 4˚C after which time 3mL was transferred to a 25mL serum bottle containing 21mL of MQ water. An additional 1mL of a 5 Molar solution of sodium hydroxide was added to the bottle before it was crimped and sealed. The bottle was stored in the dark and at 4˚C.

3. Calibration

3.1 DMS

A four to six level calibration table was used for calculating the concentrations of DMS. The standards were prepared in water and run under the same conditions as described above, for the samples. Normally a continuing calibration standard is run after all samples from a station have been run or every 12 hours, which ever comes first, to ensure the calibration curve is still within acceptable limits.

4. Quality Control

4.1 DMS

System blanks and duplicates were run approximately every 13 samples to ensure the system remained free of contamination and had acceptable reproducibility. All blanks were non-detectable and duplicates did not differ by an average 10% (well within the acceptable limits of 20%). Stripping efficiency was evaluated at the beginning of the cruise and was proven to be acceptable at over 97%. A performance evaluation mixture (PEM) was run at the start of every cast to further ensure method accuracy.

4.2 DMSP

Blanks and duplicates were collected at every station. Blanks were done by simply treating MQ water as an actual sample. For example, in the case of $DMSP_D$ it was put through a separate funnel and for $DMSP_T$ it was added directly to the polypropylene tube.

5. Data & Results

5.1 DMS

There were no problems this cruise and the system ran very well. As per historical February data sets; the results were very low. Finally, due to weather and time constraints the cast at P26 had to be modified to allow for other groups to collect samples and as a result only nine depths for DMS and DMSP were tripped.

5.2 DMSP

Samples are to be shipped to the following address for analysis:
Laboratoire Maurice Levasseur
A/S Martine Lizotte
Québec-Océan
Université Laval
Pavillon Alexandre-Vachon #2071
Québec (Qc)

6. Conclusions

6.1 DMS

Instrument and analysis performed very well on this cruise. No issues to report and no problems to correct.

6.2 DMSP

No problems to report.