2011-27

CCGS *JP Tully*

Dimethylsulfide (DMS) & Dimethylsulfoniopropionate (DMSP) Report

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1. Sample Collection

Samples were collected from all major stations (P2, P4, P12, P16, P20, P26) for DMS, $DMSP_{D\ (dissolved)}$ & $DMSP_{T\ (total)}$.

1.1 DMS

Fourteen water samples from various depths (300m, 200m, 175m, 100m, 75m, 50m, 40m, 30m, 25m, 20m, 15m, 10m, 5m, surface) were collected at each of the stations P4, P12, P16, P20 & P26. At P2 there were eleven samples collected (100m, 75m, 50m, 40m, 30m, 25m, 20m, 15m, 10m, 5m, surface). In all cases, samples were collected in 250ml ground glass stoppered bottles and stored in a fridge, 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). The only exception to this was P2 where there were no 175m or 200m samples, hence, only 4 samples were collected.

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 as soon as possible after being collected.

2.2 $DMSP_D$

Approximately 50-75ml 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 then stored in the dark and at 4˚C where it would be analysed back at IOS at a later date.

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 then stored in the dark and at 4˚C where it would be analysed back at IOS at a later date.

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. A calibration curve was valid for 12 hours. If analysis exceeded 12 hours, a continuing calibration standard was run to ensure the calibration curve was 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. Stripping efficiency was evaluated at the beginning of the cruise and was proven to be acceptable at over 99%.

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

For this cruise there were many additional duplicates taken at the stations. These duplicates were run under different conditions. For example, one set of duplicates were analyzed as soon as possible after being taken while the second set of duplicates (from same niskin and taken at the same time) were run as the final two samples. This spanned a time of about 4 hours. A second experiment was undertaken by taking triplicates instead of duplicates. These triplicates were run one after another. Both sets of experiments were done to determine potential mixing issues in the niskin bottles and the effect time has on the integrity of the samples due to the time of analysis from the first sample in the cast, to the last. Preliminary results seem to indicate that sample integrity is not compromised providing the samples are stored in the fridge and in the dark and that there may indeed be mixing and settling issues within the niskin that affect DMS duplicates. Additional data will be

gathered on future cruises. Finally, getting a clean blank at sea continues to be a challenge but is eventually achieved with multiple runs. This is something that will have to be addressed in the off season.

5.2 DMSP

Samples are to be run here at IOS within the next few months.

6. Conclusions

6.1 DMS

The system worked very well this cruise. A UPS power supply was installed for this cruise in order to protect the GC and PC and it also worked very well under the shipboard power.

6.2 DMSP

No problems to report.