2017-001

CCGS *JP Tully*

Dimethylsulfide (DMS) & Dimethylsulfoniopropionate (DMSP) Report

February 5 to February 21, 2017

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1. Sample Collection

Samples were collected from all major stations (P2, P4, P12, P16, P20, P26) for DMS and $DMSP_T$ (total).

1.1 DMS

Fourteen water samples from various depths (300m, 200m, 150m, 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 250 ml 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 $DMSP_T$ were collected (200m, 150m, 30m, 20m, 5m, surface). The only exception to this was at P2 where there were no 150m or 200m samples, hence, only four samples were collected. Duplicates were taken at 20m. No samples collected for $DMSP_D$ due to the funnels being left back at the lab.

2. Analysis

2.1 DMS

A sample was loaded onto the stripper and purged with UHP Nitrogen for 10 minutes at ~100 ml/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 $DMSP_T$

3.5 ml of seawater were collected directly from the Niskin into a polypropylene tube (15 ml) containing 50 µl 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 96%.

4.2 DMSP

Blanks and duplicates were collected at every station. Blanks were done by simply treating MQ water as an actual sample. For $DMSP_T$ it was added directly to the polypropylene tube.

5. Data & Results

5.1 DMS

Sample results were typical for a February cruise with the exception of the 50m sample at P4 (sample number 67). The sample was re-run the same day but still was about 15x higher than the other samples. Ten days later I was able to collect and run the sample again only to have the result on that day fall within the same range as all the others. The result was flagged in the data set. Result validity is inconclusive.

5.2 DMSP

$DMSP_T$ samples were run back at IOS but not reported due to contamination. No $DMSP_D$ samples were collected.

6. Conclusions

6.1 DMS

The system worked well for this cruise. The MQ water system also worked well and there was no contamination peaks that interfered with the DMS standards.

6.2 DMSP

I forgot to bring the funnels for the $DMSP_D$ samples and as a result water for this analysis could not be collected for this cruise. $DMSP_T$ samples were run but not reported due to contamination. These samples were run six months after being collected and although they should've remained stable during this time it appears storing the samples in plastic falcon tubes for long periods of time (more than a few months) is contributing to the contamination problems.