# 2008-26

# CCGS *JP Tully*

# Dimethylsulfide (DMS) & Dimethylsulfoniopropionate (DMSP) Report

# May 28, 2008 to June 17, 2008-06-23

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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. 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; one at the surface, two in the mixed layer, one in the deep chlorophyll max and two in the salinity mix layer. At P4 the samples were taken in duplicate to provide precision data.

## 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 into 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 or five 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 4% (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 96%. 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. At P4, all samples were collected in duplicate for statistical validation of the method. 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. There was only one data point that was unusual and that was sample 350. This was a 5m sample from P20 and it was non-detectable for DMS. This was unusual because there was detectable DMS in the profile and for it to simply disappear at or near the surface is uncharacteristic. There was nothing unusual about the sample in terms of how it was collected and the 10m

sample did also show a very low DMS value implying that there was a diminishing trend happening. The sample could be crossed referenced with other analysis performed on the same niskin to determine overall validity but based on just this analysis it is considered a valid number.

5.2 DMSP

Samples were 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. This was also the first cruise where we no longer did the diurnal cycle at P26.

6.2 DMSP

The only potential problem was that the 25ml serum bottles were not packed and left at the lab. As a replacement the chlorophyll vials were used. Their volume was slightly lower than that of the serum bottles and as a result only 20ml of MQ water was added to the vial prior to the addition of the sample. The vials were also screw top versus crimp top but they did have an appropriate liner in the cap and appeared to seal adequately. Hopefully this oversight does not affect the analysis.