Quantification of DMSP in macroalgae

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DMSP can be quantified using gas chromatography with flame photometric detection after hydrolysis to DMS and acrylate in 0.5 to 10 M NaOH.

Material:

- Glass vials, screw-thread caps with holes and PTFE/silicone septa. Size depends on algal material; I commonly use Fisher "4 mL" vials VGB-100-336L, Fisher caps VGB300-484D, Fisher septa VGB-200-885C.
- Balance
- Forceps
- Tissue paper
- 0.5 M NaOH

Procedure:

- Put 3 mL of 0.5 M NaOH into a "4 mL" vial (actual volume of vial is about 4.92 mL). Prepare caps with PTFE/silicone septa with the (red) teflon facing to the inside, (white) silicone facing to the outside of the vial. Label vials with running numbers (take log in labbook etc.)
- Select algal material from field/culture.
- Remove epiphytes if necessary/possible?
- Blot algae dry and weigh off about 15 mg of material for chlorophytes, probably about 50 mg for coralline rhodophytes(?).
- Put weighed algae into the opening of the vial (try to keep algae outside the NaOH for as long as possible)
- Close vial **immediately** and mix to start hydrolysis of DMSP to DMS.
- Store vials at room temperature in the dark until ready to be analysed.

Note: When closing the vial, make sure the vial is gas tight. Too lose and it will leak (obviously…) but too tight and it will leak as well. Typically, the lid is gas-tightly closed when, during closure, the septum just starts to bulge to the inside of the vial.

Reference

Steinke M., P. Brading, P. Kerrison, M.E. Warner, D.J. Suggett 2011. Concentrations of dimethylsulfoniopropionate (DMSP) and dimethylsulfide (DMS) are strain-specific in symbiotic dinoflagellates (*Symbiodinium* sp., Dinophyceae). Journal of Phycology 47: 775–783