

Shipboard Collection Procedures for Seawater $DI^{14}C$

For the GO-SHIP program, clean baked glass bottles are provided by NOSAMS in individually numbered plastic crates containing 16 500-ml bottles each. Each box and bottle/top combination have unique ID numbers that should be used as the sample identifier and correctly listed on the collection sheets provided in the sampling kits. If no number appears on the box, please add one to the outside of the box and record it on the sampling sheet.

Bottles should be handled as little as possible and removed from their packing crates just prior to sampling. Wear clean, disposable gloves any time the bottles are handled. Lab counter surfaces should be covered using the provided plastic bags before placing bottles on surfaces. Please use the provided collection sheets to record the required information and note any problems or comments on the sheet. If possible, make a copy or scan the collection sheet before placing the originals in each crate of bottles. At the end of the cruise, email the scanned sheets to rhansman@whoi.edu.

Steps for collection:

- Immediately prior to sampling, remove the glass stopper and dispose of the laboratory wipe (always make sure the strips of lab wipe have been removed before collecting any seawater).
- Attach the Tygon tubing to the Niskin bottle. Flush the tubing and remove trapped air with approximately 50 ml of water. Now place the tubing inside the sample bottle and fill the bottle with approximately 50 ml of water; gently swirl around the sides of bottles and discard; repeat once more.
- With the Tygon sampling tube at the bottom of the bottle, fill with enough water to fill the bottle 1.5 times; this can be accomplished by observing the amount of time it takes to fill the bottle and allowing the bottle to overflow for half this time. Carefully spill out just enough water so the stopper can be gently placed back into the bottle.
- Repeat this procedure for the remaining samples from the cast. Using this procedure, a $DI^{14}C$ water sample in a 500-ml bottle will require approximately 850 ml of water.
- When all the bottles have been filled, move them to a safe, dry place and continue preparing the samples for storage.
- Remove the stopper; wipe clean and very dry; using the grease syringe or gun, apply a thin layer of grease in a wavy pattern around the stopper; set the stopper aside.
- Using the large pipette or just by pouring, remove enough water for a 5-10 ml headspace to exist in the bottle; this level can be marked on the bottle. Headspace should be minimized but the water level should not reach the stopper joint to allow for a proper seal.
- Carefully and completely wipe the inside of the ground glass joint dry using lab wipes and place the dried and greased stopper in the bottle. Care must be taken not to put your finger in the sample. The joint **MUST BE DRY** for the grease seal to work properly!
- Using the Eppendorf pipette or other provided dispenser, add 100 μ l of the saturated $HgCl_2$ solution to the bottle. If you are unsure whether a sample has been properly poisoned, a second aliquot can be added.
- Place the matching numbered stopper into the bottle neck. Push down gently on the stopper, rotating slowly. This will help make the grease joint seal.

- Secure the bottle top with one rubber band placed over the entire bottle and cap.
- After bottles are filled, capped, and secured with an elastic band, shake gently to mix in poison.
- After all samples from one cast have been taken and sealed, each label/data sheet should be checked to make sure it contains the necessary information, and the integrity of the greased seals should be checked (i.e., should look clear, not bubbly). Data from the collection sheets for samples collected should be entered into an Excel spreadsheet with the following columns: whpid, station, cast, niskin, depth, bottle number, box number, comments. Put a copy of the collection sheet into the provided Tyvek envelope and place in the sample crate.
- Close the plastic shipping crate securely using provided zip-ties. Store boxed samples in a temperature-controlled environment (i.e., the ship's science hold or main lab space). Seawater samples must not be exposed to extremes of temperature. Poisoned samples do not need to be refrigerated and should **NEVER BE FROZEN**.