

Alert Level: **ADVISORY**

Software Version: All RAS versions

Instrument: All RAS-100 and RAS-500 samplers

Subject: Water Sample Preservative

Summary: HgCl₂ is a popular preservative for oceanic water samples. Ultimately, the choice and concentration of preservative for a time-series instrument is a part of science. Thus, the final choice of preservative must be made by the user to fit the scientific objective.

Potential Negative Effects: Adding preservative changes the nature of seawater and particulate samples. HgCl₂ preservative is not recommended for salinity measurements with an electrode-based sensor. An inductivity-coupled salinometer can be used under high-HgCl₂ concentration samples (personal communication, Dr. K. Hayashi, MOI, 2003).

Technical Details: In order to maintain original nutrients in water samples including NO-x, Si(OH)₄, PO₃ and DIO, up to 18 months in water temperatures from 0° to 20°C collected by a RAS, McLane recommends a sample solution with approximately 120 ppm HgCl₂. HgCl₂ solutions with a variety of concentration up to 800 ppm were tested and determined to be no more effective than the original, diluted case. Kattner (1999) reported that sea water nutrients can be preserved as long as 2 years in a 105 HgCl₂ solution. A more diluted solution, 30 ppm, might work for a long-term preservation in an aphotic water column but this concentration has not been tested extensively.

McLane recommends a pre-installation of 5 ml saturated HgCl₂ solution to the sample bag a few days before the RAS deployment. Although solubility of HgCl₂ in distilled water depends on water temperature, 1ml saturated HgCl₂ solution is expected to include 35 mg to 75 mg HgCl₂ at a water temperature between 0° and 20 °C. Under these conditions the HgCl₂ concentrations in 480 ml seawater (approximate volume of a sample bag) is 80 ppm (minimum) to 160 ppm.

Kattner, G., 1999. Storage of dissolved inorganic nutrients in seawater: poisoning with mercuric chloride. *Marine Chemistry* 67, 61-66.