

Underway pCO₂ System Description

Laboratory: University of Hawaii, Coupled Ocean-Ice Linkages and Dynamics (COLD)

Name/Vintage: Chris Carrillo, 1995.

Reference: A brief system description in:

Carrillo, C.J. and Karl, D.M., 1999. Dissolved inorganic carbon pool dynamics in northern Gerlache Strait, Antarctica. *Journal of Geophysical Research*, 104: 15,873-15,884.

Where installed: Currently shore-side. Previously deployed on the RV Polar Duke, ARSV Lawrence M. Gould and the ARIB Nathaniel B. Palmer..

Location of Data: Contact Chris Carrillo, carrillo@soest.hawaii.edu or Dave Karl, dkarl@soest.hawaii.edu.

Analyzer: LICOR 6262 nondispersive infrared detector.

Method of analysis: Concentrations of CO₂ and water were measured in the air stream from the equilibrator. Ambient marine boundary air was used as a reference for estimation of the fCO₂ difference between ocean and atmosphere.

Drying method: None. The concentration of water was measured by the LICOR.

Equilibrator (setup, size, flows): A counterflow, rotating disk equilibrator designed after *Schink, et. al. 1970* and *Sabine and Key, 1998*. The capacity of the equilibrator was 16 L.

Standards (number, concentrations, frequency): Three standards (259.28 ppm, 303.86 ppm, 373.19 ppm) were measured approx. every 2.5 hours.

Source of calibration and accuracy: The standards were obtained from NOAA CMDL and calibrated against WMO primary standards. The LICOR water channel was calibrated using a LICOR dew point generator.

Standard consumption: Not known

Operating cycle: Equilibrated gas and bow air are each sampled every 5 minutes.

Parameters recorded/frequency :

Hardware details

Temperature measurements: An OMEGA RTD measures the temperature of the water inside the equilibrator.

Pressure measurements: SETRA Model 270 pressure transducer

Circulation pathway:

Operating software: LabVIEW 3.1

Computer interface boards and sensors read:

Boards: .

Sensors:

Approximate Size and Footprint: The equilibrator is approx 1'x1'x 2'

“Unique” Hardware or operating principles worth highlighting:

What improvements would you incorporate in this system?