



^{14}C ANALYSIS OF DISSOLVED INORGANIC CARBON (DIC)

Sample Preparation:

Required sample volumes are dependent on DIC concentrations and can range from 10 to 600 mL. Water samples are injected with phosphoric acid (80%) and run through 4 stages of traps involving a dry ice/ ethanol slurry and liquid nitrogen, under pressure, to isolate and trap CO_2 in pyrex tubes. Pyrex tubes, containing the sample gas, are sealed using a propane torch and outsourced for carbon dating on an accelerator mass spectrometer (AMS).

Sample Analysis:

Accelerator mass spectrometry is used to detect carbon-14 in samples sealed in pyrex tubes. AMS dating involves accelerating the ions to extraordinarily high kinetic energies followed by mass analysis. Samples are converted to graphite prior to AMS carbon dating. Although more expensive than radiometric dating, AMS dating has higher precision, and needs small sample sizes.