

## **Isotopes of carbon and oxygen in carbonates Analysis Protocols Stable Isotope Lab, (SIL) INSTAAR, University of Colorado**

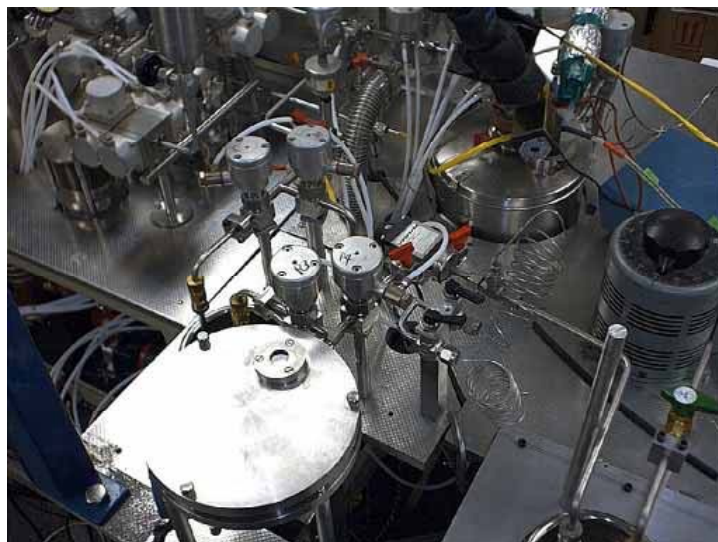


A Micromass SIRA Series II Dual Inlet mass spectrometer is used to analyze carbon and oxygen isotopes in carbonates using a common acid bath carousel prep system. Standard techniques are employed including cold fingers, LN<sub>2</sub> for freezing CO<sub>2</sub> and beaded water traps. Typical reproducibility between multiple standards in one set of samples is  $\pm 0.07$  in  $\delta^{13}\text{C}$  of carbon.

The carbonate carousel can hold 44 samples and standards for automated analysis. Phosphoric acid is held at 90°C by water

from a temperature-controlled bath that circulates around the double wall acid vessel. A magnetic stir bar keeps the acid mixed and insures sample reaction. Samples can be run with carbon content as little as a few percent carbon by weight, but double cold finger method used on these samples is more time consuming and LN<sub>2</sub> consumptive.

The preparation of the phosphoric acid is accomplished using a procedure modified from Coplen, *et al.* (1983). We use 712 ml of phosphoric acid (85%) and 500g phosphorus pentoxide, heated to 200 degrees C for 7 hours, then at 220 degrees C for 4.5 hours. Final specific gravity at room temperature is between 1.90 and 1.94. The acid is stored in a sealed container with an argon head space to reduce the absorption of any additional water vapor.



Coplen, T.B, Kendall, C., and Hopple, J. Comparison of stable isotope reference samples. *Nature*, vol 302, March 1983.