

<b>Meta Data Report</b>	
PI:	Roberta Hamme
Operation description:	Discrete analysis of dissolved neon, argon, krypton, xenon, and possibly nitrogen on CTD casts
Sampling times and locations:	Sampled the deep cast (Station 1) between 1500m and 4600m, one mid-depth cast (Station 10) between 150m and 1500m, and 9 other casts (Stations 2, 4, 13, 14, 22, 25, 37, 46, 51) in the upper 100m. See CTD cast logs and bottle files for specific times, locations, and flask numbers for each cast.
Overall sampling strategy:	All samples were collected in duplicate. Collected one full depth profile (made up from several casts). Collected mixed layer and upper thermocline samples from casts at a variety of wind speeds, attempting to focus on higher winds to investigate the effects of bubble-mediated gas exchange on noble gases.
Sample collection:	Roberta Hamme collected all noble gas samples. Noble gases were collected after dissolved oxygen but before carbon parameters. Due to the need to reduce the amount of time that water in the Niskin experiences a headspace, sampling of higher priority gases was delayed until noble gases were ready to be sampled on specific Niskins. Whenever possible, noble gases were collected from different Niskins than hydrography to alleviate wait times and the potential confusion of out-of-order sampling. Sample flasks are evacuated in the lab prior to shipment. Carbon dioxide gas was flushed through the necks of the sample flasks prior to sampling to reduce the possibility of air contamination. Water from the Niskin was sucked into the flasks until they were about half full. After sampling, flask necks were cleaned with fresh water and dried with a rolled up Kimwipe. Carbon dioxide was placed between the double O-rings and in the necks of the flasks to preserve the samples.
Expected initial data products:	No initial data will be available.
Expected distributed data products, and time-frame for distribution:	Dissolved inert gas concentrations and saturations will be available in late summer or early fall when it is possible to schedule time on the mass spectrometer and sample processing equipment.
Analytical method	Back at the lab, sample flasks are weighed. The headspace is equilibrated with the water sample at a known temperature, followed by removal of the water phase. The gas sample is cryogenically pumped through a -100oC ethanol trap to remove water, exposed to a hot gettering material to remove all but the noble gases, spiked with an exact amount of 38-Ar, and topped up with a helium balance gas. The sample is run against a standard of similar composition on a MAT 253 isotope ratio mass spectrometer, measuring simultaneous Ar isotopes, and peak jumping to measure gas ratios. Air standards are processed in the same way and used to calibrate the mass spec standard. See Hamme and Severinghaus (2007) Deep-Sea Research I for further methodological details.
Instrument details	Sampling board was from the Hamme Lab. Carbon dioxide provided in full-size cylinders by Emerson lab and used on both legs of P18 prior to SOGasEx. A 50 foot tube extended from the cylinder tie-up area fore of the Rosette along the wall, through a loop of bungee cord attached to the light just fore of the staging bay doors, over to the Rosette where it was secured to the wire with a second bungee and then draped over the Niskin bottles. "V" series flask provided by Hamme Lab and not spiked with HgCl <sub>2</sub> . Plain numbered flasks provided by Emerson Lab and spiked with HgCl <sub>2</sub> .
<b>Operation Log</b>	
Affected data	Comments
Station 13, Cast 1, Niskins 9 and 10	Carbon dioxide tank was empty when sampling began. There was a 10-15 minute delay as the back-up was wrestled onto deck. Thanks to Paul Schmieder and Paul Covert for fast, effective help with that! Niskins 9 and 10 were sampled for 3He, SF <sub>6</sub> , and O <sub>2</sub> during this time and had a headspace for longer than usual before I could sample
Station ??, Cast ?, Niskin ?, Flask ?	Broke plunger of sample flask during cleaning of the valve.