

AT15-6 Volatile Chemistry/CTD/Resistivity Probe Goals and Accomplishments  
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### Goals

Our goals were 1) to collect as many gas tight samples as possible so that we could compare pre-eruption and post-eruption volatile concentrations; 2) to conduct a CTD cast and collect samples for helium and methane from a plume to compare with the New Horizon data; and 3) to deploy one or more resistivity probes in high temperature vents for long term monitoring of temperature and chloride concentration until November, 2006.

### Accomplishments

We collected 16 gas tight samples which represent 8 separate hydrothermal vents. The gas was extracted from these samples and sealed in breakseal ampoules for return to shore based labs. Helium concentrations and isotopic ratios will be analyzed in the laboratory of John Lupton (NOAA/PMEL). In Marvin Lilley's laboratory (U. Washington) the concentrations of carbon dioxide, methane, ethane, propane, butane, hydrogen, carbon monoxide, nitrogen, oxygen, argon, neon, and nitrous oxide will be determined. We will also do carbon stable isotopic analyses on carbon dioxide and methane and stable hydrogen isotopes on methane and hydrogen.

Preliminary total gas data indicate that major changes have occurred in the volatile compositions of the vents we have sampled. For instance, Q vent now has about one-fourth the total gas as it had in November 2004. The gas concentrations at Q were relatively stable between 1991 and Nov 2004. The implication is that the connectivity of Q vent to a magma lens has been altered in a major way. In addition, fluid flow at M vent (about 200 m north of Q), which has historically also maintained high gas concentrations, has completely stopped. The gas composition at both P and Io vents has decreased by about one-half since Nov 2004.

We conducted one CTD cast about 100 m east of P vent in a complex, four layered hydrothermal plume. The results of this cast have not yet been worked up. When complete the data from this cast will be compared to the data collected on CTD casts on the New Horizon cruise.

One resistivity probe was deployed in Io vent (375°C) and will be recovered in November 2006 on Karen Von Damm's cruise. The instrument was programmed to record temperature and fluid resistivity data on a 35 sec interval.