Reactor 27 | May 2023 - August 2023 Summary

**\*\* The project lead is responsible for double checking all laboratory normalizations and applying any additional corrections, as needed.**

**Session information:**

## Responsible for QC and corrections to final lab data: Kirsten Andrews [September 2023]

Add any significant updates in a different color or link to a new summary file: here.

## Description of session:

## Reactor 27 lasted 3 months from the middle of May to the middle of August. The reactor started by analyzing waters (and priming when needed) before switching to carbonates at the end of the reactor. 135 water samples, 22 carbonates, and 58 primes went through the reactor total. Reactor 27 ended due to high standard deviations, low yield values, and inconsistent values that are typical with a dying reactor. SMOWs and SLAPs were analyzed at the beginning, in the middle, and towards the end of Reactor 27, but SMOWs and SLAPs were not the last samples to be analyzed.

## Decisions about correction of data (breaks, linear vs basic correction etc):

Reactor 27 was reduced using a linear correction with no segment breaks. SMOW values stay fairly consistent throughout the reactor, ranging from -7 to 5 per meg in residual. SLAP values ranged from -17 to 3 per meg in residual at the beginning of the reactor, and increased throughout the reactor, ending with SLAP values between 2 and 14 per meg in residual. Overall, both SMOW and SLAP values stay close to 0 per meg. All standards in this reactor (including SMOW, SLAP, USGS47, USGS45, and IAEA-C1) ranged from -20 to 14 per meg ([see R27\_3allCorr\_std.pdf](https://drive.google.com/file/d/1FA2gP1WzjWOyrFhDUoZH2kZ3z6NhiPxC/view?usp=drive_link)). The average of SMOW, SLAP, and USGS45 waters run on Reactor 27 (0 per meg, 0 per meg, and 13 per meg respectively) match well with the overall average values for SMOW, SLAP and USGS45 waters (0 per meg, 0 per meg, 13.77 per meg respectively). The same can be said for IAEA-C1s. IAEA-C1s run during this reactor had an average of -100 per meg, while the overall average for IAEA-C1s is -100.1 per meg. USGS47 was lower (29 per meg) than the overall average (34.65 per meg) for this standard, but only by ~5 per meg ([see stdSummary\_box](https://drive.google.com/file/d/1rkw22-7tAo88hxcp3J2hNz1EO6kTp2zq/view?usp=drive_link)).

Version info:

* One version with a linear correction and no segments.

## Changes to script or file structure/formatting

* None

## Notable Events:

* 5/15/23: Kirsten updated computers
* 5/16/23: Kirsten opened bottle 8 of SMOW. Retired bottle 7.
* 5/18/23: Kirsten added ref gas - 1 aliquot - 20nA at 83.9%
* 5/24/23: Kirsten added ref gas - 1 aliquot - 20nA at 79.8%
* 5/30/23: Kirsten purged ballast on scroll pump for 15 mins
* 5/31/23: Kirsten added ref gas - 1 aliquot - 20nA at 83.9%
* 5/31/23: Kirsten switched He tank @ 4:20pm
* 6/8/23: Kirsten added ref gas - 1 aliquot - 20nA at 84.8%
* 6/2/23: Kirsten purged ballasts on scroll pump for 15 mins
* 6/14/23: Kirsten added ref gas - 1 aliquot - 20nA at 79.8%
* 6/23/23: Kirsten updated and restarted the computers
* 6/23/23: Kirsten replaced septum for waters
* 6/27/23: The background pressure on vac gauge 1 and the acid bath gauge were high (0.469 mbar and 550 mtorr respectively). Opened and closed different valves but high pressure continued. Changed the acid bath but high pressure continued. Then noticed the temperature reader on the acid bath was at 156 degrees celsius so Ben and Kirsten changed out the Watlow temperature controller for a new one and the temperature went back down to the normal 90 degrees celsius and the gauges went back to normal pressures as well.
* 6/29/23: Kirsten added ref gas - 1 aliquot - 20nA at 84.8%
* 7/3/23: Kirsten purged ballasts on scroll pump for 15 mins
* 7/13/23: Kirsten added ref gas - 1 aliquot - 20nA at 82.6%
* 7/20/23: Started running carbonates - starting with IPL-17O-4912
* 7/21/23: Kirsten added ref gas - 1 aliquot - 20nA at 81.9%
* 7/24/23: Jungpyo changed acid bath and loaded samples
* 7/26/23: Kirsten purged ballasts for 15 mins
* 7/28/23: Kirsten changed acid bath and loaded samples
* 7/31/23: Kirsten added ref gas - 1 aliquot - 20nA at 79.9%
* 8/7/23: Jungpyo and Kirsten changed the tip seals on the scroll pump backing the carbonate line (aka Nancy)