# Elemental Scientific

# Selenium in Saline Waters

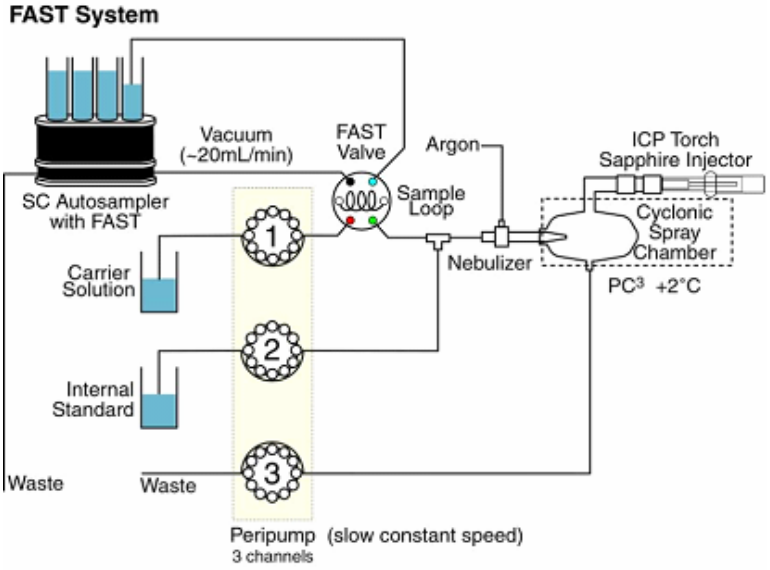
The Great Salt Lake (GSL) is a large migratory bird habitat with very high salinities (12% - 27%), up to 7.5x that of seawater. Selenium cycling and monitoring in the lake is the first important step in understanding potential biomagnifications and their impact on bird populations.
The combination of SC-FAST with ELAN DRC ICPMS facilitates low level Se determinations in high salinity samples that are both precise and accurate.

Benefits of SC-FAST for Elan

- Signal enhanced
- Stability improved
- Throughput doubled
- Salt load reduced

SC-FAST for Elan

Sample Preparation:
0.5mL methanol and 0.5mL nitric acid are added to 2mL of filtered (0.4µm) sample and made up to 50mL with high purity (18MΩ) water. (25x dilution)




Salt free ELAN sampler cone after >300 GSL samples

Nebulizer Liquid Flow rate: 300µL/min
Internal Standard : Rh
Carrier Solution: 1% $HNO_3$
Nebulizer: PFA-ST

ICP-MS: PE ELAN DRC
Forward Power: 1600W
Cell Gas: $O_2$, 1.5mL/min
m/z: 80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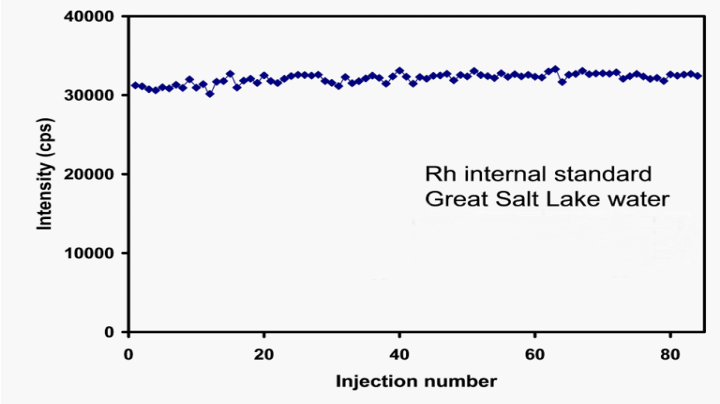
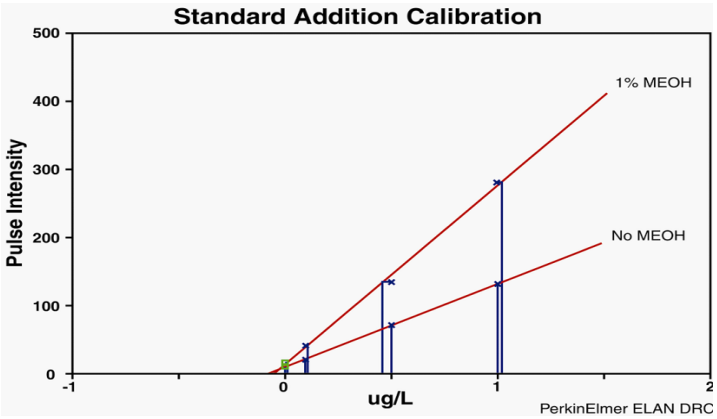
## Stability




- > 80 replicates injections of 25 fold diluted sample.
- > 0.5% Total dissolved solids
- ~ 3% RSD, excellent precision
- No salt deposition on ICPMS cones
- Increased throughput

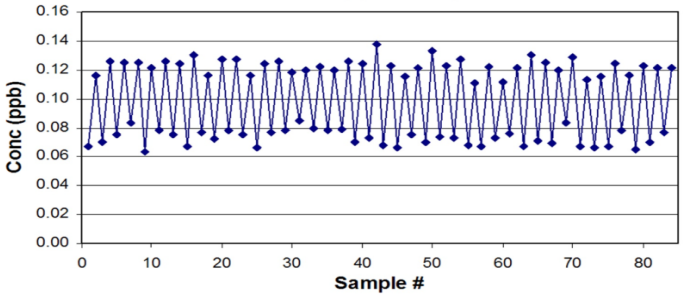
## Calibration Data




- Carbon enhancement effect on poor ionizers such as Se
- Low blanks
- Improved detection limits

| DL as Analyzed | DL in GSL Water |
|---|---|
| 0.017 ppb | 0.40 ppb |

## Recovery




| Precision & accuracy | |
|---|---|
| Spike | 0.040 ppb |
| Det. (n=5) | 0.041ppb |
| RSD (%) | 4.5 |

Alternate analysis of GSL sample & 40ppt spiked GSL sample, showing excellent precision and accuracy.

## Summary

The SC-FAST with ELAN method

1) Increases signal and stability
2) Decreases uptake and wash
3) Increases sample throughput
4) Reduces salt load and cone deposition

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