

Supporting Information for MS:

A critical investigation of hydride generation-based arsenic speciation in sulfidic waters

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Table S1 Coordinates and basic hydrogeochemical parameters for the six Yellowstone hot springs used for comparison of IC-ICP-MS versus HG-AFS

Sampling site	Latitude Longitude	Temperature [°C]	Conductivity [$\mu\text{S cm}^{-1}$]	pH	E _H [mV]	O ₂ [mg L ⁻¹]	Sulfide [mg L ⁻¹]	Molar ratio S/O
Ojo Caliente source	44°33.780' 110°50.333'	92.2	1590	7.7	280	0.65	1.70	1.3
Ojo Caliente 39 m		63.3	1650	8.7	160	3.34	0.09	0.0
Conch Spring source	44°33.389' 110°49.935'	92.6	1565	9.6	-190	0.90	3.63	2.0
Conch Spring 11 m		79.7	1600	9.6	-120	1.48	1.95	0.7
Conch Spring 30 m		65.5	1660	9.5	>-110*	2.19	0.60	0.1
Mound Geyser source	44°33.565' 110°50.015'	90.0	1545	9.0	-35	1.05	2.90	1.4

* no redox potential determined at 30 m from the source; at 15 m from the source redox potential was determined as -110 mV (with 1.8 mg L⁻¹ O₂), under increasingly oxidizing conditions redox potential can be expected to be higher at 30 m

Table S2. Mean arsenic concentrations and \pm standard deviation of triplicate determinations by HG-AFS for dry-ice-frozen and HCl-stabilized samples from six Yellowstone hot springs

Sampling site	Dry-ice-frozen samples			HCl-preserved samples			% Recovery HCl / flash-frozen samples
	As [$\mu\text{g L}^{-1}$]	STD [$\mu\text{g L}^{-1}$]	rel. STD [%]	As [$\mu\text{g L}^{-1}$]	STD [$\mu\text{g L}^{-1}$]	rel. STD [%]	
Ojo Caliente source	1683	± 229	± 14	799	± 37	± 5	47
Ojo Caliente 39 m	1724	± 277	± 16	1438	± 48	± 3	83
Conch Spring source	1966	± 118	± 6	343	± 12	± 4	17
Conch Spring 11 m	2062	± 177	± 9	1422	± 49	± 3	69
Conch Spring 30 m	2108	± 172	± 8	1783	± 25	± 1	85
Mound Geyser source	1695	± 109	± 6	704	± 13	± 2	42
Mean			± 10			± 3	