

REEF ICP TOTAL TEST



Sample ID: 012639L
Sample type: Seawater
Volume aquarium in Litre: 1000
Sample name: Aquarium 1
Sampling date: 10-20-2023
Date of receipt: 10-25-2023

Method: ICP-OES (inductively coupled plasma with optical emission spectrometry) and further procedures specifically for seawater.

Recommended values are optimized for coral reef aquariums.

You can find detailed information on the elements as well as recommendations for action and precise dosing instructions at:

<https://lab.fauamarin.de/en/home/analysis/93606>

Basic physical-chemical values

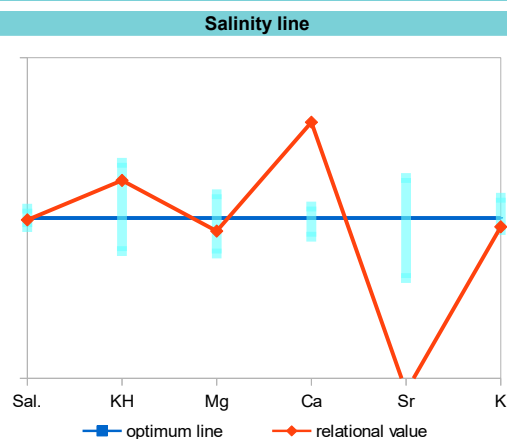
	measured	reference range
Conductivity (mS/cm 25°C)	52.9	51,7 - 53,0 - 54,5
Density (kg/Liter 25°C)	1.023	1,022 - 1,023 - 1,024
Specific density (25°C)	1.026	1,026 - - - 1,027
Salinity (ppt, psu)	34.8	34,0 - 35,0 - 36,0
pH level	8.41	7,90 - 8,30 - 8,40
Carbonate hardness (in °dKH)	8.1	6,5 - 7,3 - 8,5
CO ₂ (mg/l)	0.91	0,04 - - - 2,5
acid binding capacity pH 4,3 (mmol/L)	2.89	2,3 - 2,58 - 3,0
odor	none	none
colour	none	none

Major elements, lime elements and halogens in mg/Litre (1 mg = 0,001 g)

	measured	reference range	rel. 35 psu
Chloride Cl ⁻	19288	18700 - 19500 - 20300	19374
Sodium Na	11153	9500 - 10700 - 11500	11203
Sulphur S	813	850 - 900 - 950	817
Sulphate SO ₄ ²⁻	2436	2550 - 2700 - 2850	2447
Potassium K	384	380 - 395 - 420	386
Boron B	6.73	3,80 - 4,50 - 5,50	6.76
Magnesium Mg	1295	1200 - 1350 - 1450	1301
Calcium Ca	552	400 - 425 - 440	554
Strontium Sr	3.68	6,50 - 8,00 - 9,00	3.7
Bromine Br	81.8	55,0 - 67,0 - 75,0	82.2
Fluoride F ⁻	0.51	0,90 - 1,30 - 1,60	0.51
Iodine (total iodine, ICP-OES) I	0.045	0,055 - 0,065 - 0,080	0.045

Relational values major elements and halogens - graphic representation salinity line

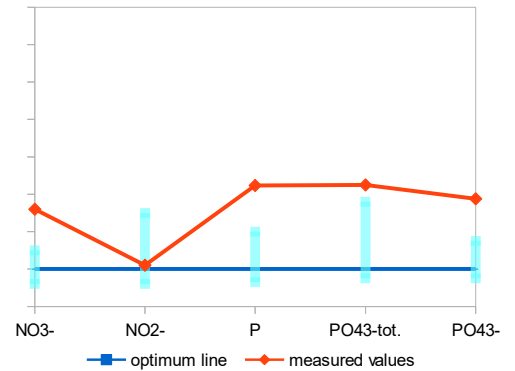
	relational value	reference range
Salinity measured : nominal Sal.	1	0,97 - 1,00 - 1,03
KH measured : nominal KH	1.12	0,90 - 1,00 - 1,17
Magnesium : Salinity Mg	37.2	33,3 - 38,6 - 42,6
Calcium : Salinity Ca	15.8	11,1 - 12,1 - 12,9
Strontium: Salinity Sr	0.11	0,18 - 0,23 - 0,26
Potassium : Salinity K	11	10,6 - 11,3 - 12,4
Boron : Salinity B	0.19	0,11 - 0,13 - 0,16
Chloride : Salinity Cl ⁻	554	519 - 557 - 597
Sulphate : Salinity SO ₄ ²⁻	69.9	71,0 - 77,0 - 84,0
Chloride : Sulphate Cl ⁻ /SO ₄ ²⁻	7.92	6,60 - 7,20 - 8,00
Magnesium : Calcium Mg/Ca	2.35	2,70 - 3,20 - 3,60
Calcium : Strontium Ca/Sr	150	44,0 - 53,0 - 68,0
Bromide : Fluoride Br ⁻ /F ⁻	160.4	34,0 - 52,0 - 83,0
Fluoride : Iodine F ⁻ /I	11.3	11,0 - 20,0 - 29,0



Macronutrients
in mg/Litre (1 mg = 0,001 g)

		measured	reference range
Nitrate	NO ₃ ⁻	21	1,00 - 10,0
Nitrite	NO ₂ ⁻	0.06	< 0,20
Phosphorus (ICP-OES)	P	0.071	< 0,06
Total Phosphate (calculated)	PO ₄ ³⁻ tot.	0.22	0,02 - 0,18
Ortho-Phosphate (photometric)	PO ₄ ³⁻	0.19	0,02 - 0,10
Silicon	Si	0.32	0,10 - 0,20
Silicate (calculated)	SiO ₂	0.69	0,20 - 0,40
Relational values			
Total Phosphate : Nitrate		96	90 - 110
Total Phosphate : Ortho-Phosphate		1.17	~ 1,00
Total Phosphate : Iodine		4.84	0,13 - 1,67

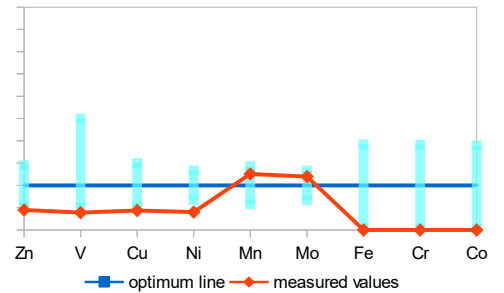
Nutrients



Physiologically relevant trace elements and color-relevant micronutrients
in µg/Litre (1 µg = 0,000001 g)

		measured	reference range
Zinc	Zn	2.47	3,00 - 8,00
Vanadium	V	1.55	2,00 - 10,0
Copper	Cu	1.75	2,00 - 6,00
Nickel	Ni	1.8	3,00 - 6,00
Manganese	Mn	0.22	0,10 - 0,25
Molybdenum	Mo	17.9	10,0 - 20,0
Iron	Fe	n.n.	0,05 - 2,50
Chrome	Cr	n.n.	0,05 - 2,30
Cobalt	Co	n.n.	0,02 - 1,90

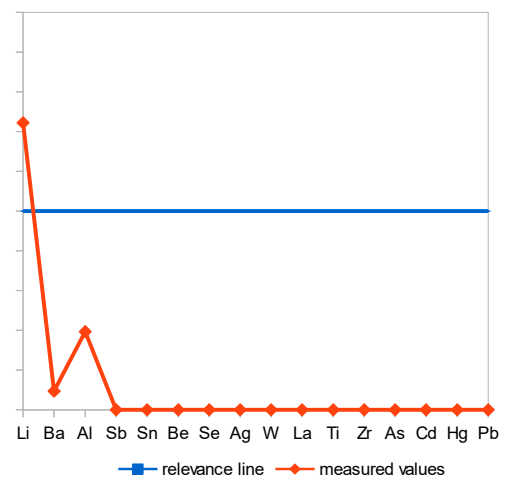
Dynamic Elements



Other trace elements and potential harmful substances
in µg/Litre (1 µg = 0,000001 g)

		measured	reference range
Lithium	Li	722	180 - 350
Barium	Ba	18.8	5,00 - 50,0
Aluminium	Al	11.8	5,00 - 30,0
Antimony	Sb	n.n.	< 10,0
Tin	Sn	n.n.	< 10,0
Beryllium	Be	n.n.	0,05 - 1,40
Selenium	Se	n.n.	0,90 - 5,50
Silver	Ag	n.n.	< 10,0
Tungsten	W	n.n.	< 30,0
Lanthanum	La	n.n.	2,00 - 10,0
Titanium	Ti	n.n.	0,50 - 3,50
Zirconium	Zr	n.n.	1,00 - 2,20
Arsenic	As	n.n.	< 1,00
Cadmium	Cd	n.n.	< 1,00
Mercury	Hg	n.n.	< 1,00
Lead	Pb	n.n.	< 1,00

Relevance line



Osmosis water

in mg/Liter (1 mg = 0,001 g)		measured	reference range
Calcium	Ca	n.n.	n.n.
Potassium	K	n.n.	n.n.
Magnesium	Mg	n.n.	n.n.
Sodium	Na	n.n.	n.n.
Sulphur	S	n.n.	n.n.
Phosphorus (ICP-OES)	P	n.n.	n.n.
Total Phosphate (calculated)	PO ₄ ³⁻ tot.	n.n.	n.n.
Silicon	Si	0.32	n.n.
Silicate (calculated)	SiO ₂	0.68	n.n.

in µg/Liter (1 µg = 0,000001 g)

Aluminium	Al	n.n.	n.n.
Lead	Pb	n.n.	n.n.
Cadmium	Cd	n.n.	n.n.
Chrome	Cr	n.n.	n.n.
Iron	Fe	n.n.	n.n.
Copper	Cu	n.n.	n.n.
Lithium	Li	n.n.	n.n.
Nickel	Ni	n.n.	n.n.
Mercury	Hg	n.n.	n.n.
Tin	Sn	2.06	n.n.
Zinc	Zn	n.n.	n.n.

Measured values of type "> 24" indicate that the concentration is above the calibrated range and therefore cannot be determined definitively. In these cases it is indicated how much at least is present (e.g. 24 µg/l). Abbreviations: n.g. (not measured), n.n. (not detectable).