

TOTAL REEF ICP TEST



Sample ID: 018650K
Sample type: Seawater
Volume aquarium in Litre: 51
Sample name: Fluval Evo 13.5
Sampling date: 03-28-2022
Date of receipt: 04-04-2022

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/21656>

Basic physical-chemical values

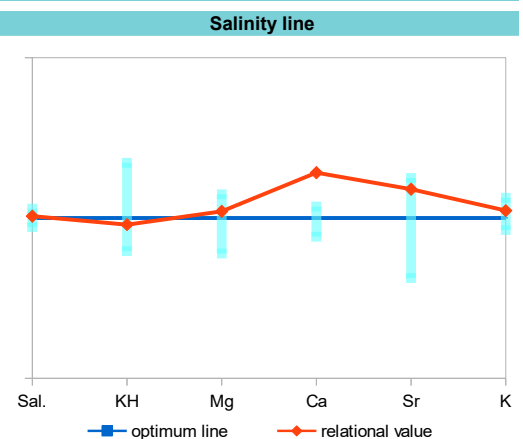
	measured	reference range
Conductivity (mS/cm 25°C)	53.4	51,7 - 53,0 - 54,5
Density (kg/Liter 25°C)	1.024	1,022 - 1,023 - 1,024
Specific density (25°C)	1.027	1,026 - - - 1,027
Salinity (ppt, psu)	35.2	34,0 - 35,0 - 36,0
pH level	7.39	7,90 - 8,30 - 8,40
Carbonate hardness (in °dKH)	7.1	6,5 - 7,3 - 8,5
CO ₂ (mg/l)	8.4	0,04 - - - 2,5
acid binding capacity pH 4,3 (mmol/L)	2.53	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 ⁻	19493	18700 - 19500 - 20300	19374
Sodium Na	10581	9500 - 10700 - 11500	10517
Sulphur S	933	850 - 900 - 950	927
Sulphate SO ₄ ²⁻	2795	2550 - 2700 - 2850	2778
Potassium K	404	380 - 395 - 420	402
Boron B	4.39	3,80 - 4,50 - 5,50	4.36
Magnesium Mg	1378	1200 - 1350 - 1450	1370
Calcium Ca	485	400 - 425 - 440	482
Strontium Sr	8.72	6,50 - 8,00 - 9,00	8.67
Bromine Br	78.3	55,0 - 67,0 - 75,0	77.8
Fluoride F ⁻	0.88	0,90 - 1,30 - 1,60	0.87
Iodine (total iodine, ICP-OES) I	0.014	0,055 - 0,065 - 0,080	0.014

Relational values major elements and halogens - graphic representation salinity line

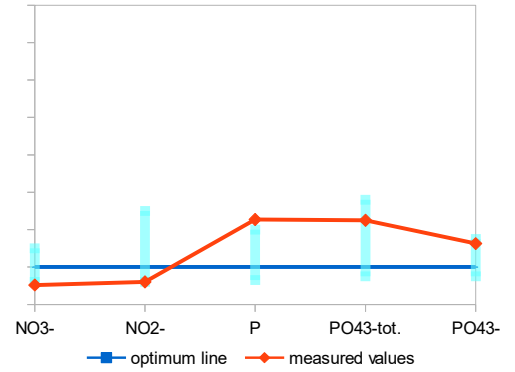
	relational value	reference range
Salinity measured : nominal Sal.	1.01	0,97 - 1,00 - 1,03
KH measured : nominal KH	0.98	0,90 - 1,00 - 1,17
Magnesium : Salinity Mg	39.1	33,3 - 38,6 - 42,6
Calcium : Salinity Ca	13.8	11,1 - 12,1 - 12,9
Strontium: Salinity Sr	0.25	0,18 - 0,23 - 0,26
Potassium : Salinity K	11.5	10,6 - 11,3 - 12,4
Boron : Salinity B	0.12	0,11 - 0,13 - 0,16
Chloride : Salinity Cl ⁻	554	519 - 557 - 597
Sulphate : Salinity SO ₄ ²⁻	79.4	71,0 - 77,0 - 84,0
Chloride : Sulphate Cl ⁻ /SO ₄ ²⁻	6.97	6,60 - 7,20 - 8,00
Magnesium : Calcium Mg/Ca	2.84	2,70 - 3,20 - 3,60
Calcium : Strontium Ca/Sr	55.6	44,0 - 53,0 - 68,0
Bromide : Fluoride Br ⁻ /F ⁻	89	34,0 - 52,0 - 83,0
Fluoride : Iodine F ⁻ /I	62.9	11,0 - 20,0 - 29,0



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

		measured	reference range
Nitrate	NO ₃ ⁻	0.2	1,00 - 10,0
Nitrite	NO ₂ ⁻	0.01	< 0,20
Phosphorus (ICP-OES)	P	0.046	< 0,06
Total Phosphate (calculated)	PO ₄ ³⁻ _{tot.}	0.14	0,02 - 0,18
Ortho-Phosphate (photometric)	PO ₄ ³⁻	0.09	0,02 - 0,10
Silicon	Si	0.37	0,10 - 0,20
Silicate (calculated)	SiO ₂	0.8	0,20 - 0,40
Relational values			
Total Phosphate : Nitrate		1	90 - 110
Total Phosphate : Ortho-Phosphate		1	~ 1,00
Total Phosphate : Iodine		10.07	0,13 - 1,67

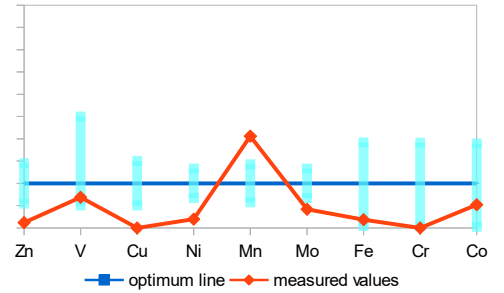
Nutrients



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

		measured	reference range
Zinc	Zn	0.64	3,00 - 8,00
Vanadium	V	2.75	2,00 - 10,0
Copper	Cu	n.n.	2,00 - 6,00
Nickel	Ni	0.89	3,00 - 6,00
Manganese	Mn	0.36	0,10 - 0,25
Molybdenum	Mo	6.3	10,0 - 20,0
Iron	Fe	0.24	0,05 - 2,50
Chrome	Cr	n.n.	0,05 - 2,30
Cobalt	Co	0.52	0,02 - 1,90

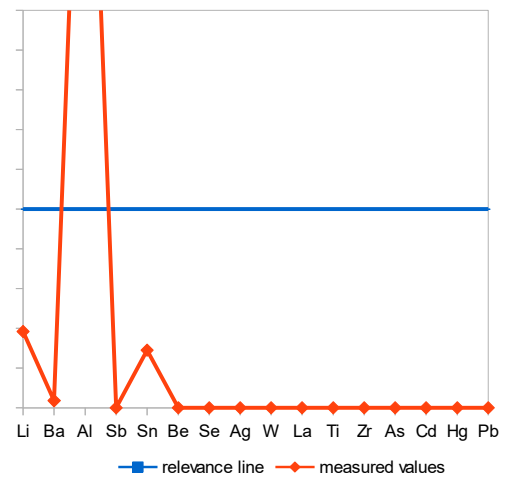
Dynamic Elements



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

		measured	reference range
Lithium	Li	192	180 - 350
Barium	Ba	7.2	5,00 - 50,0
Aluminium	Al	122	5,00 - 30,0
Antimony	Sb	n.n.	< 10,0
Tin	Sn	2.9	< 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	0.13	n.n.
Phosphorus (ICP-OES)	P	0.002	n.n.
Total Phosphate (calculated)	PO ₄ ³⁻ _{tot.}	0.01	n.n.
Silicon	Si	0.01	n.n.
Silicate (calculated)	SiO ₂	0.02	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	n.n.	n.n.
Zinc	Zn	0.46	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).