

TOTAL REEF ICP TEST



Sample ID: 20026400

Sample type: Seawater

Volume aquarium in Litre: 0

Sample name: Aquarium 1

Sampling date: 10-07-2023

Date of receipt: 10-13-2023

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.faunamarin.de/en/home/analysis/91576>

Basic physical-chemical values

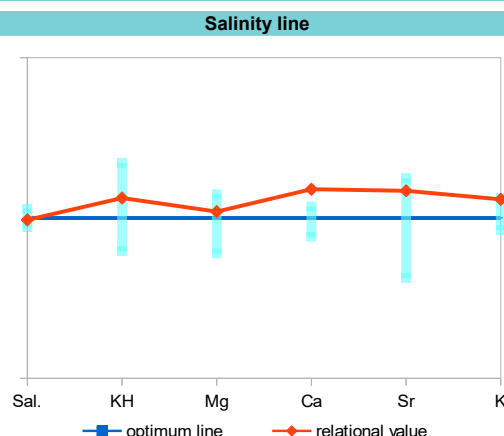
	measured	reference range
Conductivity (mS/cm 25°C)	52.9	51,7 - 53,0 - 54,5
Density (kg/Liter 25°C)	1.023	1,022 - 1,023 - 1,024
Specific density (25°C)	1.026	1,026 - - 1,027
Salinity (ppt, psu)	34.8	34,0 - 35,0 - 36,0
pH level	8.1	7,90 - 8,30 - 8,40
Carbonate hardness (in °dKH)	7.7	6,5 - 7,3 - 8,5
CO ₂ (mg/l)	1.78	0,04 - - 2,5
acid binding capacity pH 4,3 (mmol/L)	2.75	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	11450	9500 - 10700 - 11500	11501
Sulphur S	835	850 - 900 - 950	839
Sulphate SO ₄ ²⁻	2502	2550 - 2700 - 2850	2513
Potassium K	418	380 - 395 - 420	420
Boron B	4.61	3,80 - 4,50 - 5,50	4.63
Magnesium Mg	1377	1200 - 1350 - 1450	1383
Calcium Ca	463	400 - 425 - 440	465
Strontium Sr	8.68	6,50 - 8,00 - 9,00	8.72
Bromine Br	64.7	55,0 - 67,0 - 75,0	65
Fluoride F ⁻	0.97	0,90 - 1,30 - 1,60	0.97
Iodine (total iodine, ICP-OES) I	0.021	0,055 - 0,065 - 0,080	0.021

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	1.06	0,90 - 1,00 - 1,17
Magnesium : Salinity Mg	39.5	33,3 - 38,6 - 42,6
Calcium : Salinity Ca	13.3	11,1 - 12,1 - 12,9
Strontium: Salinity Sr	0.25	0,18 - 0,23 - 0,26
Potassium : Salinity K	12	10,6 - 11,3 - 12,4
Boron : Salinity B	0.13	0,11 - 0,13 - 0,16
Chloride : Salinity Cl ⁻	554	519 - 557 - 597
Sulphate : Salinity SO ₄ ²⁻	71.8	71,0 - 77,0 - 84,0
Chloride : Sulphate Cl ⁻ /SO ₄ ²⁻	7.71	6,60 - 7,20 - 8,00
Magnesium : Calcium Mg/Ca	2.97	2,70 - 3,20 - 3,60
Calcium : Strontium Ca/Sr	53.3	44,0 - 53,0 - 68,0
Bromide : Fluoride Br/F ⁻	66.7	34,0 - 52,0 - 83,0
Fluoride : Iodine F ⁻ /I	46.2	11,0 - 20,0 - 29,0



Macronutrients

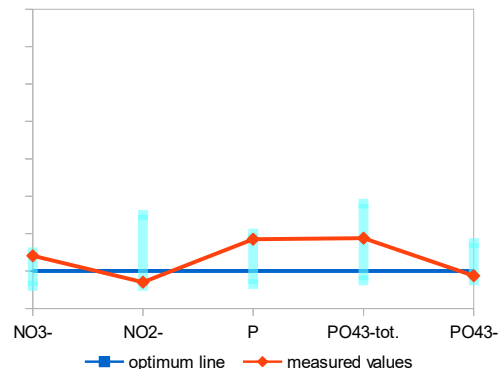
in mg/Litre (1 mg = 0,001 g)

		measured	reference range		
Nitrate	NO ₃ ⁻	9.1	1,00	-	10,0
Nitrite	NO ₂ ⁻	0.02	< 0,20		
Phosphorus (ICP-OES)	P	0.035	< 0,06		
Total Phosphate (calculated)	PO ₄ ³⁻ tot.	0.11	0,02	-	0,18
Ortho-Phosphate (photometric)	PO ₄ ³⁻	0.03	0,02	-	0,10
Silicon	Si	0.05	0,10	-	0,20
Silicate (calculated)	SiO ₂	0.1	0,20	-	0,40

Relational values

Total Phosphate : Nitrate	84	90	-	110
Total Phosphate : Ortho-Phosphate	3.35	~ 1,00		
Total Phosphate : Iodine	5.11	0,13	-	1,67

Nutrients

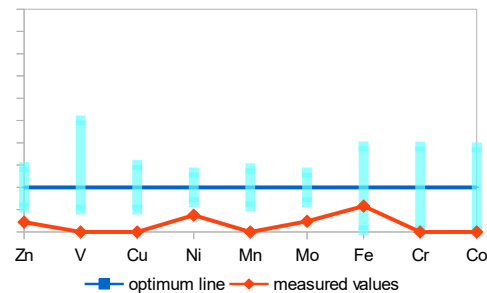


Physiologically relevant trace elements and color-relevant micronutrients

in µg/Litre (1 µg = 0,000001 g)

		measured	reference range		
Zinc	Zn	1.21	3,00	-	8,00
Vanadium	V	n.n.	2,00	-	10,0
Copper	Cu	n.n.	2,00	-	6,00
Nickel	Ni	1.69	3,00	-	6,00
Manganese	Mn	n.n.	0,10	-	0,25
Molybdenum	Mo	3.6	10,0	-	20,0
Iron	Fe	0.75	0,05	-	2,50
Chrome	Cr	n.n.	0,05	-	2,30
Cobalt	Co	n.n.	0,02	-	1,90

Dynamic Elements

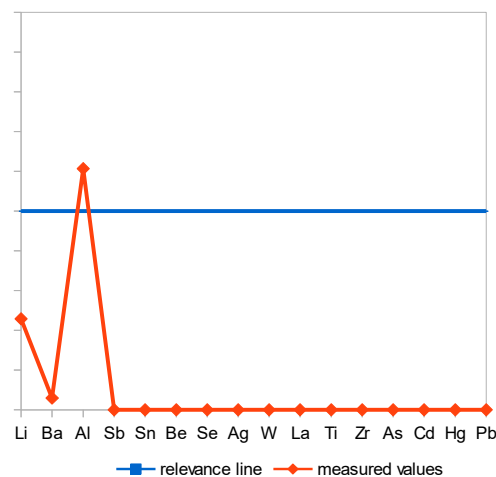


Other trace elements and potential harmful substances

in µg/Litre (1 µg = 0,000001 g)

		measured	reference range		
Lithium	Li	229	180	-	350
Barium	Ba	12	5,00	-	50,0
Aluminium	Al	36.4	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	n.n.	n.n.		
Silicate (calculated)	SiO ₂	n.n.	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	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).