

TOTAL REEF ICP TEST



Sample number 014833J

Sample type: Seawater
Volume aquarium in Litre: 550
Sample name: Schuran 550
Sampling date: 12-27-2021
Date of receipt: 01-03-2022

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

Samples are taken by the customer in accordance with DIN standards.

Recommended values are optimized for coral reef aquariums.

Basic physical-chemical values

	measured	%	reference range
Conductivity (mS/cm 25°C)	54.9	104%	51,7 - 53,0 - 54,5
Density (kg/Liter 25°C)	1.024	100%	1,022 - 1,023 - 1,024
Specific density (25°C)	1.027	100%	1,026 - - 1,027
Salinity (ppt, psu)	36.3	104%	34,0 - 35,0 - 36,0
pH level	7.83	94%	7,9 - 8,3 - 8,4
Carbonate hardness (in °dKH)	6.7	92%	6,5 - 7,25 - 8,5
CO ₂ (mg/l)	2.88	227%	0,04 - - 2,5
acid binding capacity pH 4,3 (mmol/L)	2.39	93%	2,3 - 2,58 - 3,0
odor	none		none
colour	none		colourless

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

<https://lab.faunamarin.de/en/home/analysis/14173>

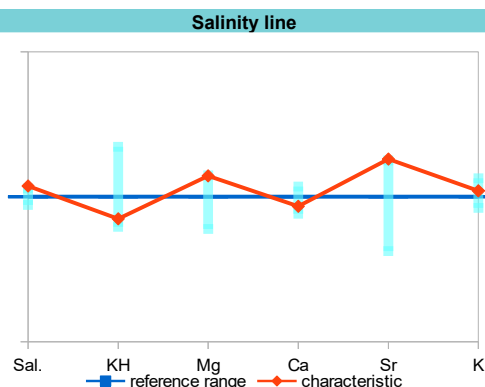
Major elements and halogens in mg/Litre (1 mg = 0,001 g)

	measured	%	reference range	rel. 35 psu
Chloride Cl ⁻	20093	99%	18700 - 19500 - 20300	19359.99
Sodium Na	11118	100%	9500 - 10700 - 11500	10712.41
Sulphur S	875	94%	850 - 900 - 950	843.08
Sulphate SO ₄ ²⁻	2621	94%	2550 - 2700 - 2850	2525.38
Potassium K	403	98%	380 - 395 - 420	388.3
Boron B	4.07	87%	3,8 - 4,5 - 5,5	3.92
Magnesium Mg	1447	103%	1200 - 1350 - 1450	1394.21
Calcium Ca	411	93%	400 - 425 - 440	396.01
Strontium Sr	9.04	109%	6,5 - 8 - 9	8.71
Bromine Br	62.6	90%	55,0 - 67 - 75,0	60.32
Fluoride F ⁻	0.41	30%	0,90 - 1,3 - 1,60	0.4
Iodine (total Iodine) I	0.03	44%	0,06 - 0,065 - 0,08	0.03

The percentages behind the measured values represent the measured value in relation to the optimal value. 100% means the value in the tank corresponds exactly to the optimal value. At values over 100% there is too much in the aquarium, at values below 100% the value should be raised according to link above.

Relation values major elements and halogens - graphic representation salinity line

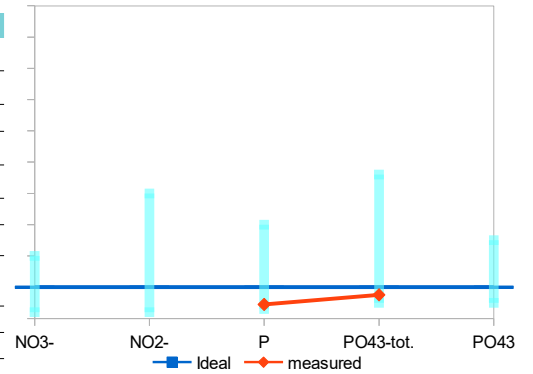
	characteristic	%	reference range
Salinity measured : nominal Sal.	1.038	104%	0,97 - 1 - 1,03
KH measured : nominal KH	0.924	92%	0,90 - 1 - 1,17
Magnesium : Salinity Mg	39.835	103%	33,3 - 38,6 - 42,6
Calcium : Salinity Ca	11.314	94%	11,1 - 12,1 - 12,9
Strontium : Salinity Sr	0.249	108%	0,18 - 0,23 - 0,26
Potassium : Salinity K	11.094	98%	10,6 - 11,3 - 12,4
Boron : Salinity B	0.112	86%	0,11 - 0,13 - 0,16
Chloride : Salinity Cl ⁻	553.143	99%	519 - 557 - 597
Sulphate : Salinity SO ₄ ²⁻	72.154	94%	71 - 77 - 84
Chloride : Sulphate Cl ⁻ /SO ₄ ²⁻	7.666	106%	6,60 - 7,2 - 8,00
Magnesium : Calcium Mg/Ca	3.521	110%	2,7 - 3,2 - 3,6
Calcium : Strontium Ca/Sr	45.465	86%	44,0 - 53 - 68,0
Bromide : Fluoride Br/F ⁻	152.683	294%	34,0 - 52 - 83,0
Fluoride : Iodine F/I	13.758	69%	11,0 - 20 - 29,0



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

Nutrients

		measured	reference range
Nitrate	NO ₃ ⁻	n.n.	0% 1,0 - 10,0
Nitrite	NO ₂ ⁻	n.n.	0% < 0,2
Phosphorus (ICP-OES)	P	0.009	24% < 0,06
Total Phosphate (calculated)	PO ₄ ³⁻ tot.	0.03	48% 0,02 - 0,18
Ortho-Phosphate (photometric)	PO ₄ ³⁻	n.g.	- 0,02 - 0,10
Silicon	Si	0.35	234% 0,1 - 0,2
Silicate (calculated)	SiO ₂	0.75	252% 0,2 - 0,4



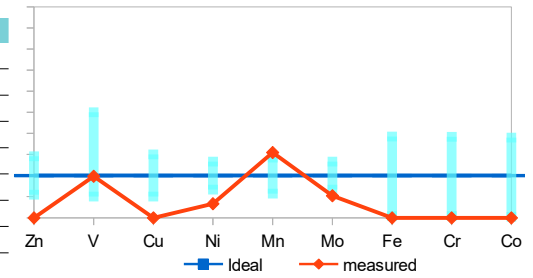
Relations

Total Phosphate : Nitrate	n.g.	-	90	-	110
Total Phosphate : Ortho-Phosphate	1	100%	~ 1	-	-
Total Phosphate : Iodine	0.97	108%	0,13	-	1,67

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

Dynamic Elements

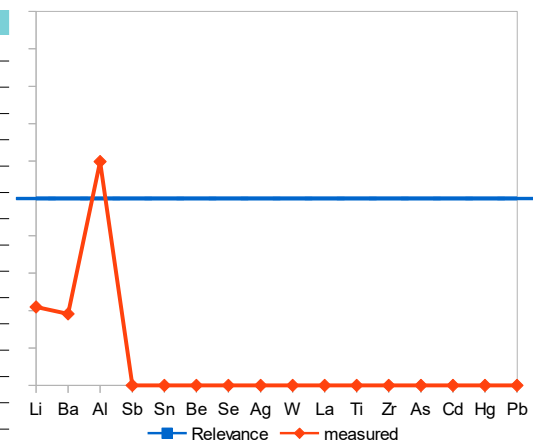
		gemessen	Referenzbereich
Zinc	Zn	n.n.	0% 3 - 8
Vanadium	V	3.94	66% 2 - 10
Copper	Cu	n.n.	0% 2 - 6
Nickel	Ni	1.49	33% 3 - 6
Manganese	Mn	0.27	156% 0,100 - 0,250
Molybdenum	Mo	7.8	52% 10 - 20
Iron	Fe	n.n.	0% 0,05 - 2,50
Chrome	Cr	n.n.	0% 0,05 - 2,30
Cobalt	Co	n.n.	0% 0,02 - 1,90



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

Relevance line

		gemessen	Referenzbereich
Lithium	Li	210	79% 180 - 350
Barium	Ba	76.4	218% 20 - 50
Aluminium	Al	35.9	205% 5 - 30
Antimony	Sb	n.n.	0% < 10
Tin	Sn	n.n.	0% < 10
Beryllium	Be	n.n.	561% 0,05 - 1,40
Selenium	Se	n.n.	0% 0,9 - 5,5
Silver	Ag	n.n.	0% < 10
Tungsten	W	n.n.	0% < 30
Lanthanum	La	n.n.	0% 2 - 10
Titanium	Ti	n.n.	0% 0,5 - 3,5
Zirconium	Zr	n.n.	0% 1,0 - 2,2
Arsenic	As	n.n.	100% < 1
Cadmium	Cd	n.n.	100% < 1
Mercury	Hg	n.n.	100% < 1
Lead	Pb	n.n.	100% < 1



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).