



# ICP Water Analysis

**Sample-ID:** TM0900007581

Sample type: **Seawater**  
 Aquarium volume in liters: **670**  
 From your aquarium: **Salty**  
 Date of taking the water sample: **03-03-2026**  
 Receipt of the sample: **03-09-2026**

Methodology: ICP-OES (inductively coupled plasma with optical emission spectrometry) and other methods specific for seawater; recommended values are optimized for coral reef aquariums. Detailed information on the elements as well as specific recommendations for action and precise dosing instructions can be found at <https://lab.tropic-marin.com/de/home/analysis/12441>

## Basic physical and chemical values

	meas. Value	Optimal range	Recommendation
Electrical conductivity (mS/cm 25°C)	n.g.	49 - 53	-
Density (kg/liter, calculated 25°C)	n.g.	1,022 - 1,023	-
Relative density (calculated 25°C)	n.g.	1,024 - 1,026	-
Salinity (psu, calculated)	n.g.	32 - 35	-
pH value	n.g.	7,8 - 8,4	-
Alkalinity (°dKH)	n.g.	6,5 - 8,0	-
CO <sub>2</sub> -Content (mg/l)	n.g.	0,04 - 2,50	-
Acid binding capacity pH 4.3 (mmol/L)	n.g.	2,32 - 2,85	-
Odor	none	none	
Coloring	none	colorless	

## Tropic Marin Block Analysis System

	Messwert	Rel. 35 psu	Optimal range	Recommend.	Product recd.
Iodine (total iodine, ICP-OES) (mg/l) I	<b>0.053</b>	n.g.	0,05 - 0,09	ideal	Block Iodine
Molybdenum (µg/l) Mo	<b>7.4</b>	n.g.	10 - 20	increase	Block Molybdenum
Nickel (µg/l) Ni	<b>1.04</b>	n.g.	3 - 6	increase	Block Nickel
Strontium (mg/l) Sr	<b>4.78</b>	n.g.	6,5 - 9,0	increase	Block Strontium
Zinc (µg/l) Zn	<b>1.67</b>	n.g.	3 - 8	increase	Block Zinc

### Tropic Marin Block Analysis System

**Tropic Marin** has developed a system that can support ICP-OES analysis: We know that different elements are consumed in the aquarium in relation to each other. Changes in the concentration of a single element therefore result in proportionally equal changes in the concentration of the other elements in this group. If you know the requirement of an element, you can use this indicator element to calculate the consumption of several other elements. Defined indicator or lead elements can be analyzed very well using ICP-OES and have a very low tolerance range.

Particularly in the case of seawater salts, which contain a large number of elements, it is more expedient to consider only special indicator elements (with low measurement tolerance) among the measured values of the ICP-OES and to include the elements with a very low concentration in a certain ratio. Concentration data with high measurement tolerances of the ICP-OES for elements that are difficult to determine can be neglected in this way without causing a deficiency in these elements. **Tropic Marin** has developed element mixtures from the above-mentioned element groups: the **Tropic Marin BAS Solutions** (BAS = Block Analysis System). Based on the lead elements, all other elements in the aquarium are (co-)dosed - even elements with very low natural concentrations, which may not be analyzed in the ICP-OES (as they are below the measuring limit).

## Makroelemente, lime household elements and halogens in mg/Liter (1 mg = 0,001 g)

		meas. Value	Rel. 35 psu	Optimal range	Recommend.	Product recd.
Chloride	Cl-	<b>n.g.</b>	<b>35</b>	18000 - 19500	-	
Natrium	Na	<b>11703</b>	<b>n.g.</b>	9400 - 11000	lower	
Sulfur	S	<b>898</b>	<b>n.g.</b>	820 - 950	ideal	Sulfur
Potassium	K	<b>438</b>	<b>n.g.</b>	380 - 420	lower	Potassium
Boron	B	<b>4.32</b>	<b>n.g.</b>	3,8 - 5,5	ideal	Boron
Magnesium	Mg	<b>1389</b>	<b>n.g.</b>	1200 - 1450	ideal	Magnesium
Calcium	Ca	<b>363</b>	<b>n.g.</b>	400 - 480	increase	Calcium
Strontium	Sr	<b>4.78</b>	<b>n.g.</b>	6,5 - 9,0	increase	Strontium
Bromine	Br	<b>70.2</b>	<b>n.g.</b>	55 - 75	ideal	Bromine
Iodine (total iodine, ICP-OES)	I	<b>0.053</b>	<b>n.g.</b>	0,05 - 0,09	ideal	Iodine

## Relative values of macroelements and halogens (relative factors)

		Relative value	Optimal range
Salinity meas. value : target value	Sal.	<b>n.g.</b>	0,94 - 1,03
KH measured value : target value	KH	<b>n.g.</b>	0,87 - 1,07
Magnesium : Salinity	Mg	<b>n.g.</b>	33,3 - 42,6
Calcium : Salinity	Ca	<b>n.g.</b>	11,1 - 12,9
Strontium: Salinity	Sr	<b>n.g.</b>	0,18 - 0,26
Potassium : Salinity	K	<b>n.g.</b>	10,6 - 12,4
Boron : Salinity	B	<b>n.g.</b>	0,11 - 0,16
Chloride : Salinity	Cl-	<b>n.g.</b>	519 - 597
Magnesium : Calcium	Mg/Ca	<b>3.826</b>	2,7 - 3,6
Calcium : Strontium	Ca/Sr	<b>75.941</b>	44 - 68

## Physiologically relevant trace substances and color-relevant micronutrients In µg/Liter (1 µg = 0,000001 g)

		meas. Value	Optimal range	Recommend.	Product recd.
Zinc	Zn	<b>1.67</b>	3 - 8	increase	Zinc
Vanadium	V	<b>2.6</b>	2 - 10	ideal	Vanadium
Copper	Cu	<b>1.06</b>	2 - 6	increase	Copper
Nickel	Ni	<b>1.04</b>	3 - 6	increase	Nickel
Manganese	Mn	<b>0.67</b>	0,5 - 1,2	ideal	Manganese
Molybdenum	Mo	<b>7.4</b>	10 - 20	increase	Molybdenum
Iron	Fe	<b>2.5</b>	0,05 - 0,60	lower	Iron
Chrome	Cr	<b>n.n.</b>	0,05 - 2,30	increase	Chromium
Cobalt	Co	<b>n.n.</b>	0,02 - 1,90	increase	Cobalt

## Other trace elements and potential pollutants in µg/Liter (1 µg = 0,000001 g)

		meas. Value	Optimal range	Recommend.	Product recd.
Lithium	Li	206	180 - 350	ideal	Lithium
Barium	Ba	14.1	5 - 20	ideal	Barium
Aluminium	Al	11.5	5 - 30	ideal	
Antimony	Sb	n.n.	0 - 10	ideal	
Tin	Sn	n.n.	0 - 10	ideal	
Beryllium	Be	n.n.	0,1 - 1,4	ideal	
Selenium	Se	n.n.	0,15 - 0,30	increase	
Silber	Ag	n.n.	0 - 10	ideal	
Tungsten	W	n.n.	0 - 30	ideal	
Lanthanum	La	n.n.	2 - 10	ideal	
Titanium	Ti	n.n.	0,5 - 3,5	ideal	
Zirconium	Zr	n.n.	1,0 - 2,2	ideal	
Arsenic	As	n.n.	0 - 1	ideal	
Cadmium	Cd	n.n.	0 - 1	ideal	
Mercury	Hg	n.n.	0 - 1	ideal	
Lead	Pb	n.n.	0 - 1	ideal	

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