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ICP MS by oceamo

Analysis Report

Date of Analysis: 27.08.2026
Analysis No: OF260027
Date of Sampling: 22.08.2026 - 0,5

Customer: Andrew Pierce
Customer ID: 9318
Tank: other

Main Parameters

Parameter	Messwert	Ideal Value	Bewertung
Conductivity	922,0 µS/cm	20-800 µS/cm	↗
Alkalinity (KH)	1,41 dKH	0,5-15 dKH	✓
Total hardness	19,077 °dH	°dH	✓

Main Elements

Parameter	Messwert	Ideal Value	Bewertung
Calcium	127,4 mg/l	mg/l	↗
Boron	n.n.	0,05-0,15 mg/l	↓
Bromide	0,05 mg/l	mg/l	✓
Chloride	200,68 mg/l	mg/l	↑
Potassium	6,89 mg/l	5-12 mg/l	✓
Magnesium	5,38 mg/l	mg/l	✓
Sodium	26,49 mg/l	mg/l	✓
Strontium	0,47 mg/l	mg/l	✓
Sulfate	31,7 mg/l	mg/l	✓
Ca-Mg ratio	22,55	2 - 5	↑
Mg-K Ratio	0,78	1,5-2,5	↓

Trace Elements

Parameter	Messwert	Ideal Value	Bewertung
Barium	48,16 µg/l	µg/l	✓
Chromium	0,09 µg/l	0,5-5 µg/l	↘
Cobalt	0,06 µg/l	0,5-5 µg/l	↘
Iron	28,34 µg/l	10-100 µg/l	✓
Fluoride	0,16 mg/l	mg/l	✓
Iodine	7,48 µg/l	2-10 µg/l	✓
Copper	2,94 µg/l	0,5-5 µg/l	✓
Lithium	9 µg/l	µg/l	✓
Manganese	0,06 µg/l	0,5-5 µg/l	↘

Molybdenum	1,9	µg/l	0,5–5 µg/l	✓
Nickel	1,33	µg/l	0,5–5 µg/l	✓
Rubidium	3,1	µg/l	0,5–5 µg/l	✓
Selenium	0,157	µg/l	0,1–1 µg/l	✓
Vanadium	0,23	µg/l	0,5–5 µg/l	↘
Zinc	5,70	µg/l	3–10 µg/l	✓
Tin	0,06	µg/l	0,1–3 µg/l	↘
Caesium	0,23	µg/l	0,05–5 µg/l	✓

Pollutants

Parameter	Messwert		Ideal Value	Bewertung
Aluminium	0,2	µg/l	< 40 µg/l	✓
Bismuth	n.n.		< 3 µg/l	✓
Lead	0,017	µg/l	< 1 µg/l	✓
Mercury	n.n.		< 0,5 µg/l	✓
Antimony	0,119	µg/l	< 3 µg/l	✓
Titanium	n.n.		< 3 µg/l	✓
Cadmium	0,015	µg/l	< 1 µg/l	✓
Uranium	0,038	µg/l	< 5 µg/l	✓
Beryllium	n.n.		< 1 µg/l	✓
Arsenic	0,572	µg/l	< 5 µg/l	✓
Lanthanum	n.n.		< 5 µg/l	✓
Thallium	0,014	µg/l	< 1 µg/l	✓
Gallium	n.n.		< 3 µg/l	✓
Tellurium	n.n.		< 3 µg/l	✓
Thorium	n.n.		< 3 µg/l	✓
Cerium	n.n.		< 1 µg/l	✓
Ruthenium	n.n.		< 1 µg/l	✓
Neodymium	n.n.		< 1 µg/l	✓
Tungsten	n.n.		< 3 µg/l	✓

Nutrients

Parameter	Messwert		Ideal Value	Bewertung
Phosphate (calculated)	2,90	mg/l	mg/l	↑
Total Phosphorus (ICP)	947	µg/l	µg/l	↑
Nitrate	52,29	mg/l	5–50 mg/l	↑
Nitrite	0,006	mg/l	< 0,05 mg/l	✓
Silicon	9355	µg/l	µg/l	↗

Osmose

Parameter	Messwert	Ideal Value	Bewertung
Copper (RO)	n.n.	µg/l	
Zinc (RO)	n.n.	µg/l	
Silicon (RO)	132 µg/l	µg/l	

No action required

Need for action

Urgent need for action

n.n Not found

n.b Not measured

Interpretation

Dear Andrew,
thank you for sending in your water sample. Since the sample was taken directly before your weekly 90% water change, the analysis provides a useful picture of the maximum accumulation occurring during your normal weekly cycle.
The most striking finding is the mineral composition. Conductivity is relatively high at 922 µS/cm, while KH is only 1.41 dKH and total hardness is high at 19.1 °dH. Calcium is very high at 127.4 mg/L, whereas magnesium is only 5.38 mg/L. This results in an extremely calcium-dominated Ca:Mg ratio of 22.6:1. Potassium is well positioned at 6.9 mg/L.
For a mixed Caridina/Neocaridina aquarium, I would consider this strongly shifted mineral composition worth correcting. The overall hardness is high, and especially the very large excess of calcium relative to magnesium is not ideal. Depending on the exact Caridina species or strains being kept, the overall mineralization may also be considerably higher than desirable. I would therefore review how the replacement water is remineralized and aim for a substantially more balanced calcium-to-magnesium ratio.
Chloride is also remarkably high at 201 mg/L, while sodium is only 26.5 mg/L. The chloride concentration therefore cannot primarily be explained by sodium chloride. Together with the exceptionally high calcium concentration, this strongly points towards the use or accumulation of a calcium- and chloride-containing salt, such as calcium chloride.
We also checked whether the unusual major-ion composition is chemically plausible by calculating the ionic charge balance. The measured major cations and anions balance very well, with only a small charge-balance deviation of approximately 2–3%. This means that the unusual calcium and chloride concentrations are internally consistent and there is no indication that a major ion is missing from the analysis. I would therefore specifically check the composition of all remineralization and fertilization products being used for a possible calcium chloride source.
The nutrient concentrations are relatively high for a small, heavily planted aquarium. Nitrate is 52.3 mg/L and therefore slightly above our general target range, while phosphate is approximately 2.9 mg/L. Nitrite is reassuringly low at 0.006 mg/L.
Since you are using a modified fractional EI fertilization approach, elevated nitrate and phosphate are not unexpected. However, considering that 90% of the aquarium water is already replaced every week, the concentrations measured directly before the water change indicate a substantial weekly nutrient input. I would therefore consider reducing the macronutrient dosing somewhat rather than maintaining nitrate and phosphate at these levels.
The trace-element profile is generally good. Iron is 28.3 µg/L, iodine 7.5 µg/L, molybdenum 1.9 µg/L and zinc 5.7 µg/L, providing a good supply of these elements. Copper is 2.94 µg/L and therefore within our target range. This is particularly reassuring in a shrimp aquarium, where elevated copper concentrations deserve special attention.
On the other hand, manganese is extremely low at only 0.06 µg/L. Chromium and cobalt are also very low, and vanadium is below our usual plant-oriented target range. In a heavily planted aquarium, these low ultra- and trace-element concentrations can become limiting even when iron itself is sufficiently available.

I would therefore not simply increase a conventional broad-spectrum micronutrient fertilizer, since this could simultaneously increase elements that are already sufficiently present. Missing ultra- and trace elements can instead be supplemented selectively, for example using Oceamo Custom Elements. This allows the trace-element supply to be adjusted according to the actual analytical results without unnecessarily increasing iron, copper, zinc or other elements that are already adequately supplied.
The pollutant profile is excellent. Aluminium is only 0.2 µg/L, lead 0.017 µg/L and cadmium 0.015 µg/L, while mercury is not detectable. Arsenic, uranium and the other investigated pollutants are likewise present only at very low concentrations or are not detectable. There is therefore no indication of problematic heavy-metal contamination.
The supplied RO reference water is also reassuring regarding metals: neither copper nor zinc is detectable. Silicon is only 0.13 mg/L in the RO water, compared with a remarkably high 9.36 mg/L in the aquarium.
This very large difference indicates that silicon is being introduced or released somewhere within the aquarium rather than originating from the RO water. Possible sources include certain substrates, stones or other silicate-containing materials. Silicon itself is not a toxicity concern for the shrimp, but high concentrations can promote diatom growth when the other conditions are suitable.
Overall, the analysis does not show a problematic heavy-metal situation, which is particularly good news for a shrimp aquarium. The main point I would optimize is the mineral composition: total hardness and conductivity are relatively high, calcium is extremely dominant relative to magnesium, and chloride is unusually elevated. I would specifically check the products used for remineralization and fertilization for calcium chloride or other chloride-containing salts and adjust the replacement water towards a considerably more balanced Ca:Mg composition.
At the same time, nitrate and phosphate could be dosed somewhat more conservatively, while genuinely deficient ultra- and trace elements can be supplemented selectively. With the very large weekly water changes you are already performing, optimizing the composition of the freshly prepared replacement water should be a particularly effective way of bringing the aquarium into a more balanced range.
If you have any questions regarding the analysis or would like help adjusting the remineralization and fertilization based on these results, I am happy to help.
Best regards,
Christoph