

High precision potassium test for 50 potassium determinations in seawater

Instruction manual

Contents of reagent set:

- 2 bottles of distilled water 2 x 250 ml (No.1)
- 1 dropping bottle with reagent (No.2)
- 2 low glass tubes with cap
- 2 high glass tubes
- 1 blue syringe 10 ml
- 2 syringes 1 ml (green + white)
- 1 flexible silicone tube
- 1 template with orange circle
- 1 reference solution (contains 400 mg/L K)

Turbidimetric tests need some routine to be interpreted exactly. That is why we added a potassium reference to this test, to give you the possibility to control your measurement.

In the beginning, you should always measure the reference first to get the experience how to read the test.

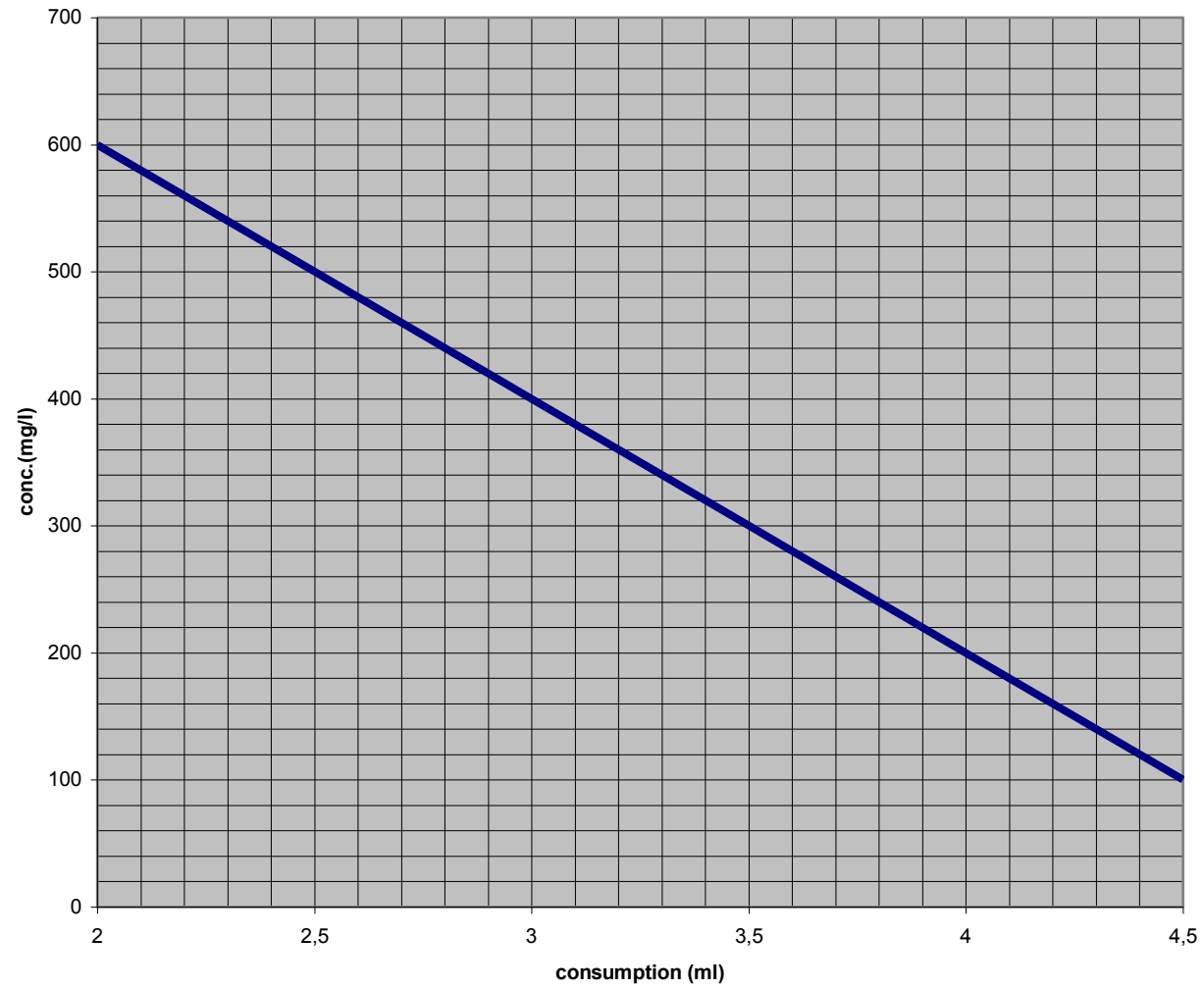
When you got more routine you can use the test without the reference.

If you didn't use it for a while, you should always start again with a reference measure.

- 1) Pull on the silicone tube on the blue syringe and take exactly **7 ml** distilled water from one of the bottles (1). Keep the tube on the syringe, some air resting in the tube does not bother. Note the hints about reading a syringe on page 3.
 - 2) Put the **7 ml** of water into one of the low glass tubes.
 - 3) Take again **7 ml** of water and put it into the other low glass tube.
 - 4) Take exactly **1 ml** of reference solution using the green syringe and put it into one of the low glass tubes.
 - 5) Take exactly **1 ml** of aquarium water using the green syringe and put it into the other low glass tube.
 - 6) Shake dropping bottle (2) and add 8 drops of the reagent into each low glass tube.
 - 7) Close the 2 tubes and shake them well. Both liquids get cloudy.
 - 8) Wait for **3 minutes**, then reopen the glass tubes.
 - 9) Fill the white syringe **3 times** with **1 ml** of the turbid liquid from the low glass tube where you filled in the reference solution. Give these **3 ml** into one of the high glass tubes.
 - 10) Put the high glass tube onto the orange circle of the template. Now you see how the turbidity has to be at the end of the measurement.
 - 11) Put the other high glass tube onto the orange circle. Take always exactly **1 ml** of the cloudy liquid from the other low glass tube (the one with the aquarium water) using the white syringe. Add the liquid slowly into the empty tall glass tube on the template. Looking from above, mind if you still can see the black cross in the orange circle better than through the other high glass tube. To compare, put the tubes alternately onto the circle.
If the white syringe is empty and you're still seeing the cross better, refill the syringe with exactly **1 ml** liquid from the low glass tube. Repeat until you just can recognize the black cross as hardly as through the other high glass tube.
- 9) Read the table to see how many potassium is in the sample. The consumption calculates from the number of completely **emptied syringes + 1 - remaining quantity** in the last syringe.

Example: 3 syringes completely consumed. From the 4th filling 0,8 ml remained in the syringe. The sum is $3 + 1 - 0,8 \text{ [ml]} = 3,2 \text{ ml}$. You see on the table that a consumption of 3,2 ml corresponds to a concentration of 360 mg/l potassium in the aquarium water.

Potassium concentration

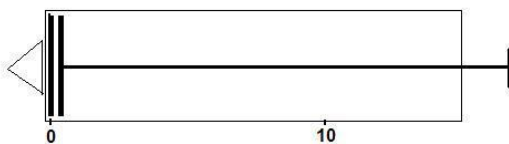


Hints:

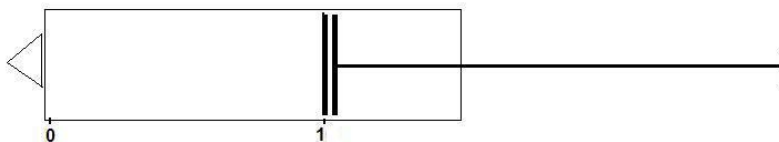
- If you've put too much turbid liquid into the second high glass tube, leading to a higher turbidity than in the reference glass tube, you can carefully refill the excessive liquid into the white syringe. Be careful to avoid air in the syringe.
- When emptying the white syringe wipe off the last drop into the high glass tubes. If you have reached the endpoint of the measurement, carefully draw back the piston until the last drop (but no air!) has completely entered the tip of the syringe.
- Please always read the manual, even if you think you have routine. Just a little inattention may lead to erroneous results.
- Clean the tubes and syringes thoroughly after each use.
- Store the test in a refrigerator.

How to read an syringe exactly:

- Look which part of the piston is exactly on the zero line when the piston is pressed completely into the syringe. This is the part that always shows the reading values (see picture).
- If there is air in the syringe after the filling, coming from the tip or the attached silicon tube, it doesn't matter. While emptying, the air goes back where it came from without changing the volume of the liquid.



Syringe empty



Syringe filled with 1 ml

Potassium in seawater aquaria

Potassium is an essential element for all aquarium inhabitants. Seawater has a concentration of about 400 mg/l, but is consumed only in minor amounts. Therefore normally a regular water change is sufficient for keeping the potassium level in a constant range. An excessive potassium level is risky for sensitive animals like shrimps.

For that reason repeat the measuring (with the reference comparison!) three times before starting to increase the potassium level.