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Spectroquant® Chlorine Cell Test

Cl₂

for the determination of free chlorine

USEPA approved for drinking water

1. Method

In weakly acidic solution free chlorine reacts with dipropyl-p-phenylenediamine (DPD) to form a red-violet dye that is determined photometrically.

The method is analogous to EPA 330.5, APHA 4500-Cl₂ G, and DIN EN ISO 7393-2.

2. Measuring range and number of determinations

Measuring range	Number of determinations
0.03 - 6.00 mg/l Cl ₂	200

For programming data for selected photometers / spectrophotometers see www.service-test-kits.com.

3. Applications

Sample material:

Swimming-pool water
Drinking water
Wastewater
Disinfectant solutions

4. Influence of foreign substances

This was checked in solutions containing 3.5 and 0 mg/l Cl₂. The determination is not yet interfered with up to the concentrations of foreign substances given in the table.

Concentrations of foreign substances in mg/l or %					
Al ³⁺	250	Mn ²⁺	100	Br ₂	0.2
Ca ²⁺	1000	NO ₂ ⁻	0.1	ClO ₂	0.2
CN ⁻	0.1	S ²⁻	0.1	I ₂	0.4
CO ₃ ²⁻	1000			H ₂ O ₂	0.05
Cr ³⁺	250			O ₃	0.05
Cr ₂ O ₇ ²⁻	0.1			NaCl	10 %
Cu ²⁺	100			NaNO ₃	10 %
Fe ³⁺	100			Na ₂ SO ₄	10 %

5. Reagents and auxiliaries

The test reagent is stable up to the date stated on the pack when stored closed at +15 to +25 °C.

Package contents:

1 bottle of reagent Cl₂-1
3 empty round cells with bar code

Other reagents and accessories:

MColorpHast™ pH-indicator strips pH 5.0 - 10.0, Cat. No. 109533
MColorpHast™ pH-indicator strips pH 0 - 6.0, Cat. No. 109531
Sodium hydroxide solution 1 mol/l TitriPUR®, Cat. No. 109137
Sulfuric acid 0.5 mol/l TitriPUR®, Cat. No. 109072

Pipette for a pipetting volume of 5.0 ml

6. Preparation

- Analyze immediately after sampling!
- The pH must be within the range 4 - 8.
Adjust, if necessary, with sodium hydroxide solution or sulfuric acid.
- Filter turbid samples.

7. Procedure

Pretreated sample (5 - 40 °C)	5.0 ml	Pipette into a clean round cell.
Reagent Cl ₂ -1	1 level blue microspoon (in the cap of the Cl ₂ -1 bottle)	Add, close the cell, and shake vigorously until the reagent is completely dissolved.
Leave to stand for 1 min (reaction time), then measure the sample in the photometer.		

Notes on the measurement:

- Certain photometers may require a blank (distilled water without reagent).
- For photometric measurement the cells must be clean. Wipe, if necessary, with a clean dry cloth.
- Measurement of turbid solutions yields false-high readings.
- The pH of the measurement solution must be within the range 4.5 - 5.5.
- The color of the measurement solution remains stable for 30 min after the end of the reaction time stated above.
- In the event of chlorine concentrations exceeding 25 mg/l, other reaction products are formed and false-low readings are yielded. In such cases it is advisable to conduct a plausibility check of the measurement results by diluting the sample (1:10, 1:100).

8. Analytical quality assurance

recommended before each measurement series

To check the photometric measurement system (test reagent, measurement device, handling) and the mode of working, a freshly prepared chlorine standard solution containing 3.00 mg/l Cl₂ (application see the website) can be used. Sample-dependent interferences (matrix effects) can be determined by means of standard addition.

Additional notes see under www.qa-test-kits.com.

Characteristic quality data:

In the production control, the following data were determined in accordance with ISO 8466-1 and DIN 38402 A51:

Standard deviation of the method (mg/l Cl ₂)	± 0.045
Coefficient of variation of the method (%)	± 1.5
Confidence interval (mg/l Cl ₂)	± 0.11
Number of lots	11

Characteristic data of the procedure:

Sensitivity: Absorbance 0.010 A corresponds to (mg/l Cl ₂)	0.025
Accuracy of a measurement value (mg/l Cl ₂)	max. ± 0.15

For quality and batch certificates for Spectroquant® test kits see the website.

9. Notes

- Reclose the reagent bottle immediately after use.
- Information on disposal can be obtained at www.disposal-test-kits.com.

