

1.14538.0065 1.14539.0495 1.14679.0495
 1.14680.0495 1.14681.0495 1.14682.0495

Spectroquant® COD solutions A+B

1. Definition

The COD (chemical oxygen demand) expresses the amount of oxygen originating from potassium dichromate that reacts with the oxidizable substances contained in 1 l of water under the working conditions of the specified procedure.

1 mol $K_2Cr_2O_7$ is equivalent to 1.5 mol O_2
 Results are expressed as mg/l COD (= mg/l O_2)

2. Method

The water sample is oxidized with a hot sulfuric solution of potassium dichromate, with silver sulfate as the catalyst. Chloride is masked with mercury sulfate. The concentration of unconsumed yellow $Cr_2O_7^{2-}$ ions or, respectively, of green Cr^{3+} ions is then determined photometrically.

The method corresponds to DIN ISO 15705 and is analogous to EPA 410.4, APHA 5220 D, and ASTM D1252-06 B.

3. Measuring range and number of determinations

Measuring range (mg/l COD)	4.0 - 40.0	10 - 150	100 - 1500	500 - 10000
Solution A Cat. No.	114538	114538	114538	114679
+ Solution B Cat. No.	114681	114682	114539	114680
Measuring wavelength (nm)	340	445 or 446	605 or 585	605 or 585
Number of Solution A determinations Solution B	210 170	210 170	210 210	225 275

4. Applications

Organic and inorganic compounds oxidizable by dichromate are measured. Exceptions: some heterocyclic compounds (e.g. pyridine), quaternary nitrogen compounds, and readily volatile hydrocarbons.

Sample material:

Groundwater and surface water
 In-process controls
 Wastewater

5. Influence of foreign substances

See the package insert of the respective Spectroquant® COD Cell Test (Cat. Nos. 114560, 114540, 114541, 114555).

6. Reagents and auxiliaries

Please note the warnings on the respective bottle!

Store the bottles protected from light!

The solutions are stable up to the date stated on the respective bottle when stored closed at +15 to +25 °C.

Other reagents and accessories:

MQuant® Chloride Test, Cat. No. 110079, measuring range 500 - ≥ 3000 mg/l Cl⁻
 Potassium hydrogen phthalate Certipur®, Cat. No. 102400
 Spectroquant® CombiCheck 10, Cat. No. 114676 (for measuring range 10 - 150 mg/l COD)
 Spectroquant® CombiCheck 20, Art. 114675 (for measuring range 100 - 1500 mg/l COD)
 Spectroquant® CombiCheck 50, Art. 114695 (for measuring range 4.0 - 40.0 mg/l COD)
 Spectroquant® CombiCheck 70, Art. 114689 (for measuring range 500 - 10 000 mg/l COD)
 Empty cells 16 mm with screw caps (25 pcs), Cat. No. 114724
 Dispenser
 Pipette for a pipetting volume of 1.0 ml (for measuring range 500 - 10 000 mg/l COD)
 Pipette for a pipetting volume of 3.0 ml (for measuring ranges 4.0 - 40.0 mg/l COD, 10 - 150 mg/l COD, and 100 - 1500 mg/l COD)
 Thermoreactor

7. Preparation

- Analyze immediately after sampling.
- Homogenize the samples.
- Check the chloride content with the MQuant® Chloride Test. Samples containing more than 2000 or, respectively, 5000 mg/l Cl⁻ must be diluted with distilled water **prior to** determining the COD.

8. Procedure

Pipette solution A and solution B into an empty cell (free of scratches and organic impurities!) according to the desired measuring range and mix. **Take care not to exceed the stated volumes!**

Measuring range (mg/l COD)	4.0 - 40.0	10 - 150	100 - 1500	500 - 10000
Solution A Cat. No.	114538	114538	114538	114679
+ Solution B Cat. No.	114681	114682	114539	114680
Volume	0.30 ml	0.30 ml	0.30 ml	2.20 ml
Volume	2.85 ml	2.85 ml	2.30 ml	1.80 ml

Suspend any bottom sediment present in the cell by swirling.

Pretreated sample 3.0 ml ¹⁾ or, resp., 1.0 ml ²⁾ **Carefully** allow to run from the pipette down the inside of the tilted cell onto the reagent **(Wear eye protection! The cell becomes hot!).**

Tightly attach the screw cap to the cell.

In all subsequent steps the cell must be held only by the screw cap!

Vigorously mix the contents of the cell.

Heat the cell at 148 °C in the preheated thermoreactor for 120 min. Remove the hot cell from the thermoreactor and allow to cool in a test-tube rack. **Do not cool with cold water!**

Wait 10 min, swirl the cell, and return to the rack for complete cooling to room temperature (cooling time at least 30 min).

Measure in the photometer.

¹⁾ applies to measuring ranges

4.0 - 40.0 mg/l COD, 10 - 150 mg/l COD, and 100 - 1500 mg/l COD

²⁾ applies to measuring range 500 - 10 000 mg/l COD

Notes on the measurement:

- Certain photometers may require a blank** (preparation as per measurement sample, but with distilled water instead of sample).
- For photometric measurement the cells must be clean. Wipe, if necessary, with a clean dry cloth.
- Measurement of turbid solutions yields false readings.
- The measurement value remains stable over a long term.
- Evaluation:
 To determine the COD values from the measurement values obtained (absorbances), prior to the COD measurement a calibration must be performed at the respective measurement wavelength for each batch used. For this purpose it is recommended to use a blank and three freshly prepared potassium hydrogen phthalate standards (application see the website) with the following COD values:

Measuring range (mg/l COD)	4.0 - 40.0	10 - 150	100 - 1500	500 - 10000
Blank (mg/l COD)	0	0	0	0
Standard 1 (mg/l COD)	10.0	20	200	1000
Standard 2 (mg/l COD)	20.0	75	750	5000
Standard 3 (mg/l COD)	40.0	150	1500	10 000

9. Analytical quality assurance

recommended before each measurement series

The Spectroquant® CombiCheck products given below can be used for this purpose. Each of these articles contains a **standard solution** to check the photometric measurement system (test reagents, measurement device, handling) and the mode of working and also an **addition solution** for determining sample-dependent interferences (**matrix effects**). Additional notes see under www.qa-test-kits.com.

Measuring range (mg/l COD)	Cat. No.	CombiCheck	mg/l COD
4.0 - 40.0	114695	CombiCheck 50	20.0
10 - 150	114676	CombiCheck 10	75.0
100 - 1500	114675	CombiCheck 20	750
500 - 10 000	114689	CombiCheck 70	5000

10. Note

The reagents must not be run off with the wastewater! Information on disposal can be obtained at www.disposal-test-kits.com.

