



Reagents for COD analysis

The Chemical Oxygen Demand (COD) is a parameter that measures the amount of **substances** dissolved or suspended in a liquid sample **that can be oxidized** by a strong chemical oxidant.

It is used to **measure the degree of contamination** and it is expressed in milligrams per liter of oxygen ($\text{mg O}_2/\text{L}$).

It is an applicable method in inland waters (rivers, lakes or aquifers), sewage, rainwater or water from any other source that may contain an appreciable amount of organic matter. This test is useful for **monitoring and control of wastewater treatment plants**. It does not apply, however, to drinking water, as there is a low content of oxidizable matter and the accuracy of the method would not be appropriate. In this case the method of oxidizability with potassium permanganate is used.

Method of analysis

The most general COD determination uses **potassium dichromate** ($\text{K}_2\text{Cr}_2\text{O}_7$) in excess in an acidic medium with the aid of silver sulfate (Ag_2SO_4) as a **catalyst**, and **mercuric sulfate** (HgSO_4) added to remove interference of chlorides. Dichromate oxidizes organic and inorganic matter in the sample, and it is reduced from Cr^{+6} to Cr^{+3} . The test is performed at 150°C under total reflux for 2 hours. After digestion, excess potassium dichromate is **titrated** with the Mohr salt using ferroin as indicator. The solution color changes from green to red.

Calculation

$\text{COD as mg O}_2/\text{L} = (\text{A}-\text{B}) \times \text{M} \times 8000/\text{mL sample}$

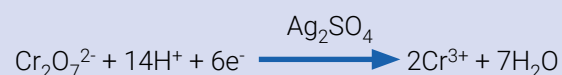
A: mL Mohr salt used for blank

B: mL Mohr salt used for sample

M: molarity of Mohr salt



- The main reaction involved in the determination of COD is:



- Chlorides can interfere according to the following reaction:



- To avoid the interference, HgSO_4 is added:



- With insufficient HgSO_4 :



The dichromate in excess (not reduced by organic/inorganic matter) is titrated with Mohr salt, Ammonium Iron(II) Sulfate, $(\text{NH}_4)_2\text{Fe}(\text{SO}_4)_2 \cdot 6\text{H}_2\text{O}$:





Product code	Product name	CAS number	Pack size
Oxidizing Agent			
132166	Mercury(II) Sulfate for analysis, ACS	7783-35-9	100 g, 250 g
Catalyst			
282922	Silver Sulfate solution 6.6 g/L in sulfuric acid for volumetric analysis	10294-26-5	1 L
283098	Silver Sulfate solution 10 g/L in sulfuric acid for volumetric analysis	10294-26-5	1 L, 2.5 L
131801	Silver Sulfate for analysis, ACS	10294-26-5	25 g, 100 g, 250 g
Reducing Agent (Mohr's Salt)			
181369	Ammonium Iron(II) Sulfate 0.1 mol/L (0.1N) volumetric solution	7783-85-9	1 L
185227	Ammonium Iron(II) Sulfate 0.12 mol/L (0.12N) volumetric solution	7783-85-9	1 L
131368	Ammonium Iron(II) Sulfate 6-hydrate (Reag. Ph. Eur.) for analysis, ISO	7783-85-9	500 g, 1 kg
Indicator			
283462	Ferriin solution 0.025 mol/L (0.025M) for volumetric analysis	14634-91-4	100 mL
COD Standard			
394546	COD Standard (1000 ppm)		25 mL

References:

Standard Methods 5220, Chemical Oxygen Demand (COD). ASTM D1252, Chemical Oxygen Demand (Dichromate Oxygen Demand) of water. ISO 6060, Determination of the Chemical Oxygen Demand (COD). Dichromate method. DIN 38409, Determination of the Chemical Oxygen Demand (COD). NFT 90-101, Determination of the Chemical Oxygen Demand. UNE 77-004.

How to order

Distributors

For ordering our high-quality products please contact your local distributor.

ITW Reagents has distributors in the countries as follows:

Algeria	Croatia	Ireland	New Zealand	Slovenia
Argentina	Czech Republic	Israel	Norway	South Korea
Armenia	Denmark	Italy	Pakistan	Spain
Austria	Ecuador	Ivory Coast	Paraguay	Sweden
Bangladesh	Egypt	Japan	Peru	Switzerland
Belarus	France	Jordan	Poland	Taiwan
Belgium	Germany	Kazakhstan	Portugal	Thailand
Bosnia and Herzegovina	Greece	Kuwait	Romania	Turkey
Brazil	Hong Kong-China	Lithuania	Russia	Ukraine
Bulgaria	Hungary	Mexico	Saudi Arabia	United Kingdom
Chile	Iceland	Montenegro	Senegal	United States
China	India	Morocco	Serbia	Uruguay
Colombia	Indonesia	Netherlands	Slovakia	Vietnam

For further contact details of our distributors please visit itwreagents.com

or contact our Customer Service at customerservice.de@itwreagents.com
customerservice.es@itwreagents.com
customerservice.it@itwreagents.com

Customers - Webshop

Authorized customers from Spain, Portugal, Austria, France and Germany can order via our webshop directly on itwreagents.com

IP-025EN

AppliChem GmbH

Ottoweg 4
DE-64291 Darmstadt
Germany
Phone +49 6151 9357 0
Fax +49 6151 9357 11
info.de@itwreagents.com

Nova Chimica Srl

Via G. Galilei, 47
I-20092 Cinisello Balsamo
(Milano) Italy
Phone +39 02 66045392
Fax +39 02 66045394
info.it@itwreagents.com

Panreac Química SLU

C/ Garraf 2, Poligono Pla de la Bruguera
E-08211 Castellar del Vallès
(Barcelona) Spain
Phone +34 937 489 400
Fax +34 937 489 401
info.es@itwreagents.com

