

NR 966

Date: 29-Sep-04

# Application Data Sheet

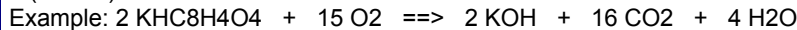
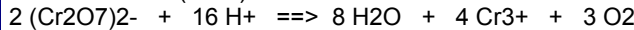
# Chemical Oxygen Demand

**Matrix**

**Industrial waste water, Municipal waste water and Surface water.**

**Principle**

Chemical Oxygen Demand (COD) is defined as the amount of a specified oxidant that reacts with the sample under controlled conditions. The quantity of oxidant consumed is expressed in terms of its oxygen equivalence. Both organic and inorganic components are subject to oxidation. The specified oxidant, dichromate ((Cr2O7)2-), is reduced to the chromic ion (Cr3+).



The unreduced dichromate is titrated with iron(II) ammonium sulfate.

**Detection method**

	Method:	Detector	Ion:	λ:
COD	Titration - Redox	Pt electrode	n.a.	n.a.

**Specification**

	Range	Standard Dev.	Repeatability	Inaccuracy	Analysis time
COD	50 - 1000 mg/l	< 1.8 % F.S.R.	+/- < 5.0 % F.S.R.	+/- < 5.0 % F.S.R.	125 minutes

**Interferences**

Addition of Mercury(II)sulfate (HgSO4) prevents Chloride interference. The ratio HgSO4 : Cl must be at least 10 : 1 (w/w). The maximum acceptable Chloride concentration in the sample is 4 g/l Chloride (Cl-) when 80 g/l Mercury(II)sulfate is added to the Potassium dichromate solution. If less chloride is present, less Mercury(II)sulfate can be added.

**Reagents**

Potassium dichromate (0.05 M)	5 ml per analysis
Silver sulfate (15 g/l) in conc. sulfuric acid	15 ml per analysis
Iron(II) ammonium sulfate (0.2 M)	max. 7.5 ml per analysis

**Procedure**

- clean the digester with DI water
- take 10 ml of sample
- add dichromate solution
- add silver sulfate solution
- perform destruction at 150 oC for two hours
- clean the analysis vessel with DI water
- transfer the destructed solution to the analysis vessel
- perform dynamic inflection point titration with Iron(II) ammonium sulfate
- calculate result

**Remarks**

Conform ISO 6060, ASTM D 1252, DIN 38409-41 and NEN 6633. Other ranges possible by changing the concentration of Potassium dichromate and Iron(II) ammonium sulfate or changing the sample volume. The titration can be performed during the destruction of the next sample to save time. Mercury(II) and Silver(I) can be removed from the waste using a selective exchanger, commercially available. A pH glass electrode can be used as an alternative reference electrode.

**Possible Analyzer**

- 2040
- 2016
- 2018 HD
- 2019 HD
- 2019 Special
- 2003 Alert
- 2004 Alert

**Typical Wet Part layout**

( Other layouts may be realised in order to meet desired criteria, e.g measuring range. )

