MODIFIED PROCEDURE

Chemical Oxygen Demand (COD)

COD Determination in Water/Wastewater Using Closed Reflux – Tritimetric Method

PURPOSE: To measure the pollutional potential of wastewaters in terms of organic matter present in it

. **DEFINITION:** The Chemical Oxygen Demand (COD) test measures the oxygen required to oxidize organic matter in water and wastewater samples by the action of strong oxidizing agents under acid conditions.

. **MATERIALS:**

15 ml COD digestion tubes	Potassium dichromate
Erlenmeyer flasks	Silver sulfate - sulfuring acid reagent
Burette, 25 ml, 1 1.	Ferrous ammonium sulfate
Magnetic stirrer	Ferroin indicator.

Reagents

1. Standard potassium dichromate digestion solution – 0.0167M

   Add to about 500 ml distilled water 4.913 g $K_2Cr_2O_7$, primary standard grade, previously dried at 103C for 2 h, 167 ml conc. H_2SO_4, and 33.3 g $HgSO_4$. Dissolve, cool to room temperature, and dilute to 1000 ml.

2. Sulfuric acid Reagent

   Dissolve 5.5 g Ag_2SO_4 in one Kg of sulfuric acid and cool.

3. Standard ferrous ammonium sulfate – 0.05 M

   Dissolve 19.2 g $Fe(NH_3)_2(SO_4)_2.6\ H_2O$ in DW. Add 10 ml conc. H_2SO_4, cool and dilute to 1000 ml. Standardise against standard $K_2Cr_2O_7$ digestion solution.

Procedure

a. Take 15 ml COD digestion tubes (pre-washed with dilute H_2SO_4) and add the following in sequence

b. Transfer 0.50 ml wastewater sample (Inlet) or 1.00 ml treated sample.

c. Add 2.5 ml standard potassium dichromate digestion reagent slowly and mix.

d. Add 3.5 ml sulfuric acid reagent through sides of the tubes and let it go to the bottom.

e. Cap and mix the contents (wear gloves as contents are very hot) and cool

f. Transfer tubes to the pre-heated COD digester at 150 C and digest for 2 hrs.

g. Run 3 blanks by substituting DW for sample and proceed exactly as sample.

Titration

Transfer the contents of the COD digestion tube in 100 ml beaker. Add distilled water to make the volume to 50 ml. Add 1-2 drops of Ferroin indicator and titrate against 0.05 M Ferrous Ammonium Sulfate solution.

Calculation:

$$\text{COD as mg } O_2/L = \frac{(A-B) \times M \times 8000}{\text{ml sample}}$$

where:

A. ml FAS used for blank
B. ml FAS used for sample
M. molarity of FAS