

# Modified limit test

Date: / / Page no: \_\_\_\_\_

→ This test is performed if the limit test for a sample can not be done by normal method. specially coloured compound.

ex.  $KMnO_4$

→ The main difference b/w limit test and modified limit test is that, a modified limit test eliminates the need for some reagent.

ex. In  $SO_4^{2-}$  limit test, → eliminate the need for  $BaSO_4$  reagents.

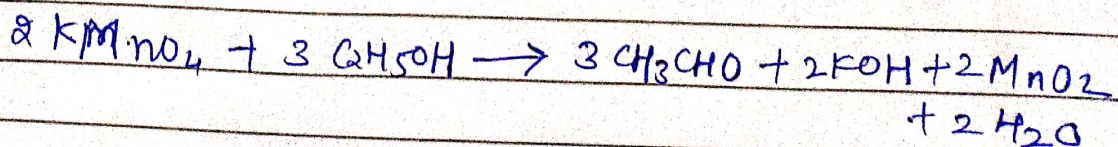
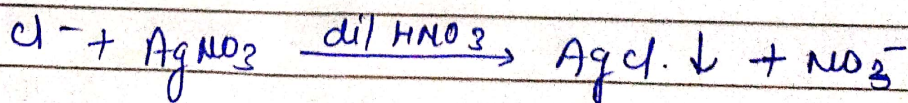
## Modified limit test for "chloride"

→ This test is used for coloured compound  $\subseteq$  can not be tested by normal test.

### Principle

→  $KMnO_4$  is decolourised by boiling w/  $CH_3COOH$ , filtered and remove precipitate of Magnese dioxide & the filtrate is now used for further test.

→ It is based on chemical reaction of freely soluble  $Cl^-$  and  $AgNO_3$  in presence of dil  $HNO_3$  to form the opalescence of  $AgCl$ .



# Procedure

Date: / / Page no: \_\_\_\_\_

## Preparation of test solution ( $\text{KMnO}_4$ )

Dissolve 1.5 gm  $\text{KMnO}_4$  (Sample) in 50 ml dist.  $\text{H}_2\text{O}$

↓

heat on water bath

↓

Gradually add 6 mL of  $\text{C}_2\text{H}_5\text{OH}$  (95%)

↓

cool & dilute to 60 ml  $\approx$  dist.  $\text{H}_2\text{O}$  + filter.

↓

use ~~the~~ Filtrate

→ Take two Nessler cylinders, as Test & Standard.

Test

Standard

→ Take 40 ml of above test sol<sup>n</sup> in N.C.

1) take 10 ml of  $\text{Cl}^-$  standard sol<sup>n</sup> (250 ppm  $\text{Cl}^-$ ) & 5 ml of  $\text{H}_2\text{O}$

→ Add 1 ml dil  $\text{HNO}_3$

2) + 1 ml dil  $\text{HNO}_3$

→ dilute to 50 ml  $\approx$  dist.  $\text{H}_2\text{O}$

3) dilute to 50 ml. dist.  $\text{H}_2\text{O}$

→ Add 1.0 ml of  $\text{AgNO}_3$  solution

4) Add 1.0 ml  $\text{AgNO}_3$

→ Stir immediately and allow for 5 minute

## OBSERVATION

1) Opalescence produced in test should not be greater than standard.

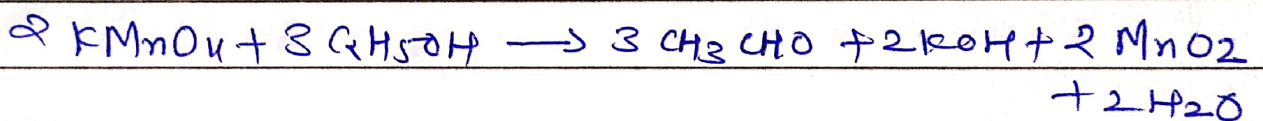
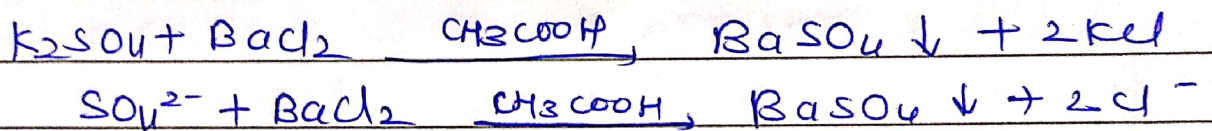
# Modified Limit test for Sulphate

Date: / / Page no: \_\_\_\_\_

→ This test is performed for the compound & can not be tested by simple limit test.

## Principle

It is based on reaction b/w  $K_2SO_4$  &  $BaCl_2$  in presence of Acetic acid, & produce opalescence / turbidity of  $BaSO_4 \downarrow$ .



## Procedure

### Preparation of Test solution ( $KMnO_4$ )

Dissolve 1.5 gm in 50 ml of dist.  $H_2O$

↓

heat on  $H_2O$  bath

↓

Add gradually 6 ml of  $C_2H_5OH$  (95%)

↓

cool & add ~~or~~ make up volume 60 ml  
in dist.  $H_2O$

↓

Now take 2 H.C. as test & standard.

TestStandard

- |   |  |
|---|--|
| 1) Take 10 ml of above test sol in N.C.                         | 1) Take 15 ml $SO_4^{2-}$ standard & Add 15 ml of dist. H <sub>2</sub> O in N.C. |
| 2) Add 0.15 mL of 5.0 M $CH_3COOH$                              | 2) — do —  |
| 3) + 2.5 ml Basol   | 3) — do —  |
| 4) + make up volume upto 50 ml $\bar{c}$ dist. H <sub>2</sub> O | 4) — do —  |
| 5) Stir immediately & allow for 5 minutes                       | 5) — do —  |

OBSERVATION

- The Turbidity of test should not be greater than standard.
- Turbidity of test > standard → sample fails
- Turbidity of test < standard → sample pass.