

Exp.9- (NH₄⁺) Ammonia Determination

Nesslerization spectrophotometric method

In waters and wastewaters, the forms of nitrogen of greatest interest are, nitrate, ammonia, nitrite and organic nitrogen. all of these forms are biochemically interconvertible and are components of the nitrogen cycle and are of interest for many reasons.

The measurement of ammonia concentration in waters by Nessler method depend on that the graduated yellow to brown color produced by the Nessler-ammonia reaction is strongly absorbed over a wide range. ($\lambda = 400-500\text{nm}$)

Reagents:

1- Ammonia free water: about 2liters by simple distillation (Boil dH₂O)

2- Standard NH₃-N solution (1000ppm)

-weight 3.819gram of anhydrous NH₄Cl, dilute in 1000 ml (1L) ammonia free water

*Anhydrous NH₄Cl, dry in oven 100 °C for 1 hour

3- K-Na Tartarate: (Rochelle salt solution)

-50gram KNa -Tartate in 100 ml dH₂O (free ammonia) you can boil this solution to expel ammonia

4- Nessler Reagent:

A-(100 gram Hg I₂+70 gram KI) dilute in small quantity of NH₄⁺ free water (about 50 ml)

B-(160 gram NaOH dilute to 50 ml (NH₄⁺ free) water

Add (A) to (B) stir gently, dilute the final volume to 1 liter,

Store in borosilicate bottle and out of sunlight_ it will stay about 1 year

Procedure:

1- prepare the standards NH₃-N as shown

Stock solution → 5 ml/100 ml dH₂O (50mg/L)

1000 mg/l

From 50mg/L	5ml/50dH ₂ O	5mg/L
	4ml/50dH ₂ O	4mg/L
	3ml/50dH ₂ O	3mg/L
	2ml/50dH ₂ O	2mg/L
	1ml/50dH ₂ O	1mg/L

2- Take 50 ml of each standard

50 ml of dH₂O (free ammonia as blank)

50 ml of sample

Sewage water has to diluted 1:10 or 1:20

3- Add 1 ml of KNa Tartarate (Filter before use (KNa Tartarate)

4- Add 1 ml of Nessler's reagent, wait for 5 minutes

5- Read at 425 n.m

- Plot straight curve

Report your result