

INTERNSHIP REPORT



A report submitted in partial fulfillment of the
requirement for the Award of Degree of
BACHELOR OF SCIENCE
IN

CHEMISTRY

BY

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Certificate of Training

This is to certify that

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From 11th to 26th September 2023.



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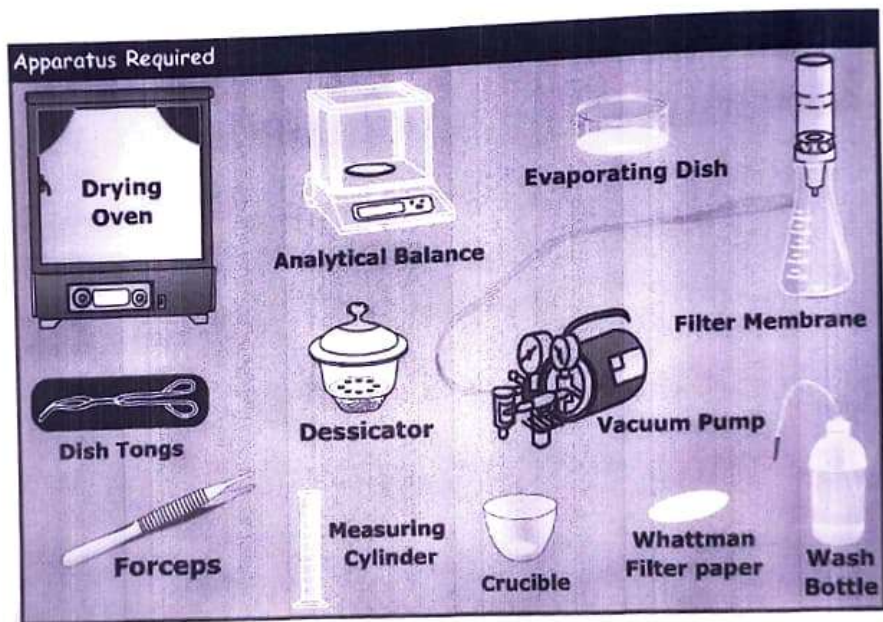
INTRODUCTION

- *Water treatment is any processes that improves the quality of water to make it appropriate for a specific end use. The end use may drinking, industrial water supply irrigation, river flow maintenance, water recreation on many other uses, including being safely returned to the environment.*
- *To provide Hiyoshi's 70 years of acquired knowledge in the field of drinking water analysis, wastewater analysis, O&M of STP, solid waste*

TOTAL DISSOLVED AND SUSPENDED SOLID **IN WATER**

- The term total dissolved solids refer to materials that are completely dissolved in water. These solids are filterable in nature. It is defined as residue upon evaporation of filterable sample.
- The term total suspended solids can be referred to materials which are not dissolved in water and are non filterable in nature. It is defined as residue upon evaporation of non filterable sample on a filter paper.

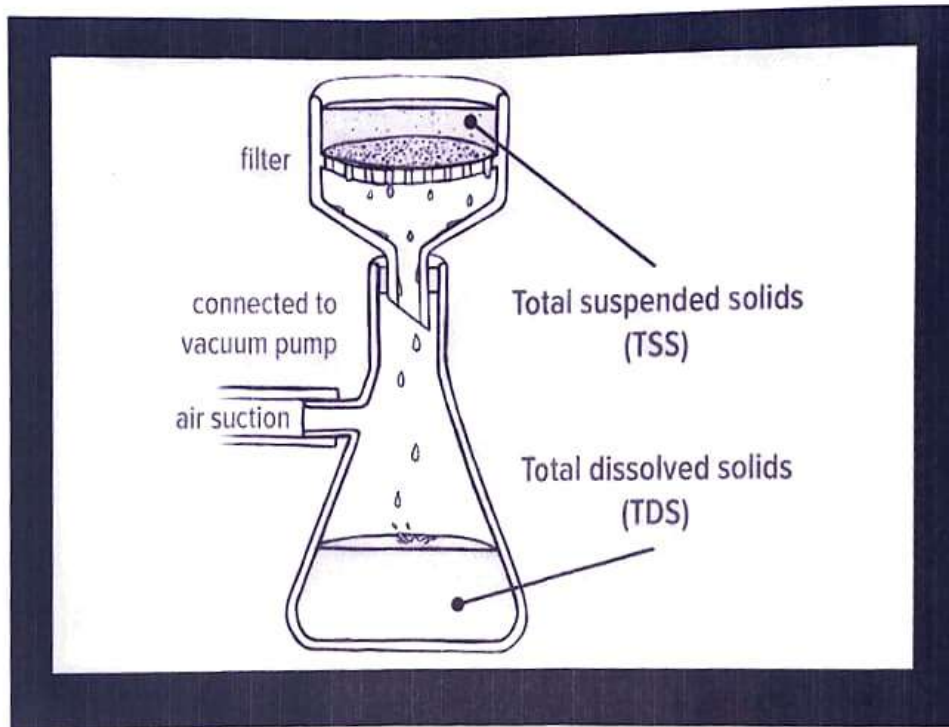
Apparatus Required



PROCEDURE

- The procedure for measuring Total Suspended Solids (TSS) and Total Dissolved Solids (TDS) is usually performed in a laboratory setting. The procedure involves:
- Filtering a water sample using a 1.5 micron filter. The particles that don't pass through the filter are considered to be TSS.
- Drying the filter in an oven at 104°C for an hour.
- Reweighing the filter and calculating the TSS.
- Rinsing the filter with distilled water.
- Drying the filter in an oven at 103-105°C for at least an hour.
- Weighing the filter and the dried residue.

PROCESS OF TSS AND TDS



TDS (TOTAL DISSOLVED SOLIDS)		Weight (g)
Weight of the clean porcelain evaporating dish (g)	W_1	35.4329
Weight of the dish and the residue (g)	W_2	35.4498
Weight of residue(g)	W	0.0169
Volume of the Sample (mL)	V	50.0
Total Dissolved Solids (mg/L)	TDS	338.0

Model

Calculation:

$$W_1 = 35.4329 \text{ g}$$

$$W_2 = 35.44980 \text{ g}$$

$$V = 50.0 \text{ mL}$$

$$\text{Weight of residue (g)} W = W_2 - W_1$$

$$= 35.4498 - 35.4329$$

$$= 0.0169 \text{ g}$$

Weight of residue in mg (To convert W (g) to W (mg), multiply W (g) with 1000)

$$\begin{aligned} W(\text{MG}) &= 0.0169 \times 1000 \\ &= 16.9 \text{ mg} \end{aligned}$$

Multiply the weight of the dry solids (in mg) by 1,000 mL/L to convert the sample size from mL to L.

Total Dissolved Solids (mg/L)

V = Volume of the sample (mL) (To convert mL to L, multiply by 1000)

$$= 16.9 \text{ mg} / 50 \text{ mL} = 0.338 \text{ mg/mL}$$

$$= 0.338 \text{ mg/mL} \times 1,000 \text{ mL/L} = 338 \text{ mg/L}$$

TSS(TOTAL SUSPENDED SOLIDS)		Weight (g)
Weight of the clean filter paper (g)	W_1	1.6329
Weight of the filter paper and the residue (g)	W_2	1.6531
Weight of residue(g)	W	0.0202
Volume of the Sample (mL)	V	100.0
Total Suspended Solids (mg/L)	TDS	202.0

Model Calculation

$$w_1 = 1.6329\text{g}$$

$$w_2 = 1.6531\text{g}$$

$$V = 100.0 \text{ mL}$$

$$\begin{aligned}\text{Weight of residue (g)} &= w_2 - w_1 \\ &= 1.6531 - 1.6329 \\ &= 0.0202 \text{ g}\end{aligned}$$

Weight of residue in mg (To convert W (g) to W (mg), multiply W (g) with 1000)

$$\begin{aligned}W \text{ (mg)} &= 0.0202 \times 1000 \\ &= 20.2 \text{ mg}\end{aligned}$$

Multiply the weight of the dry solids (in mg) by 1,000 mL/L to convert the sample size from mL to L.

Total Suspended Solids (mg/L)

$$\begin{aligned}V &= \text{Volume of the sample (mL)} \text{ (To convert mL to L, multiply by 1000)} \\ &= 20.2 \text{ mg}/100 \text{ mL} = 0.202 \text{ mg/mL} \\ &= 0.202 \text{ mg/mL} \times 1,000 \text{ mL/L} = 202 \text{ mg/L}\end{aligned}$$

SULPHATE ;

Turbidity Method

- This method is applicable to surface and ground water in the range of 1 to 40 mg/l SO₄ samples having higher concentrations than this can be measured by appropriate dilution of sample.
- Method

Principle and Theory ;

- Sulphate ion is precipitated in hydrochloric acid medium with barium chloride in such a manner as to form barium sulphate crystals of uniform size. The absorbance of barium sulphate suspension is measured by a nephelometer or transmission photometer (turbidity meter) and the sulphate ion concentration is determined by comparison of the reading with a standard curve.

APPARATUS:

- Turbidity meter or spectrophotometer -for use at 420 nm.
- Usual laboratory glass apparatus

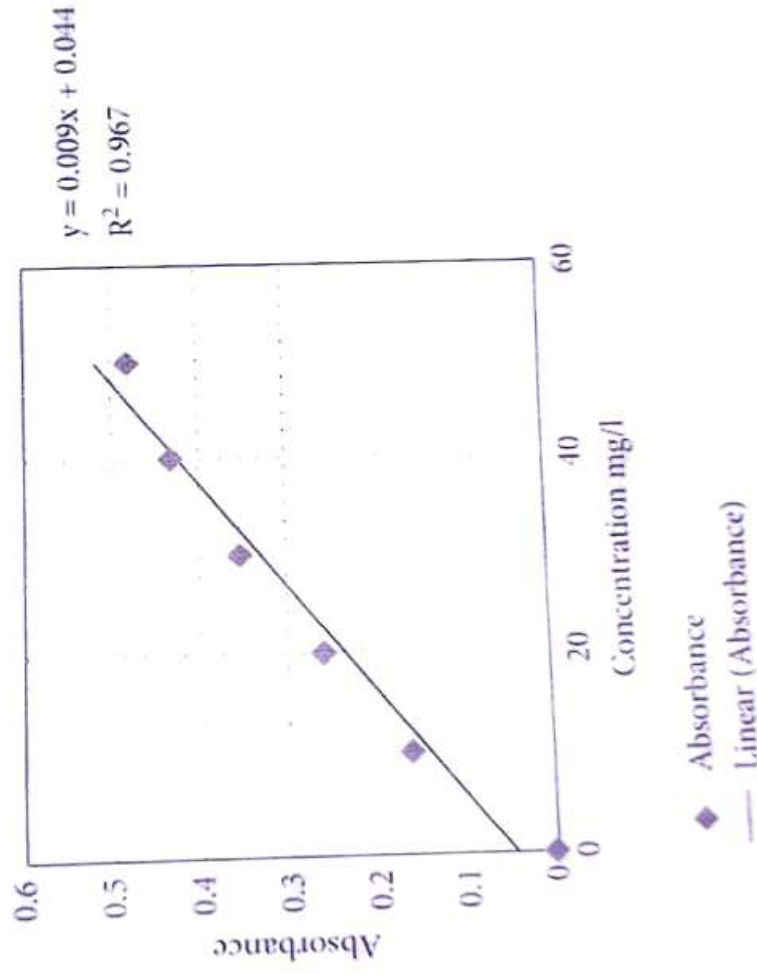
Reagents

- Barium chloride

PROCEDURE:

- Take 20 ml of clear aliquot of the water sample or suitable amount diluted to 20 ml in 100-ml conical flask.
- Add 1.0 ml hydrochloric acid solution and 1-ml conditioning reagent and mix well for 30 seconds.
- Read the absorbance on spectrophotometer after 10 minutes if glycerol conditioning reagent is used or 30 minutes if gelatin is used, at 420 nm. or. read the turbidity occurred on turbidity meter following the manufacturer's instructions to operate.

- If water sample is turbid, take 20 ml sample or suitable amount dilute to 20 ml with distilled water. Do not add conditioning reagent. Read the absorbance of this sample and subtract this value from the absorbance
- Calibration curve - Prepare a series of standards taking at least 4 standards and run a blank. Prepare a calibration curve of standards mg/l vs absorbance.
- Read the sulphate concentration of sample directly from the calibration curve.



CONCLUSION ;

- CONCLUSION in a nut shell, I would like to conclude that this internship was a whole new opening of knowledge. From first day to last day of training was an addition of acquiring new information, the work from theoretical to demo all was done in a way which was easy to grab it.
- The workings of the laboratories from the planning to its operation was also Known, in which NABL(National Accreditation Board for Testing and Calibration laboratories) was the utmost importance.
- Education is they to unlock the world as popular saying, in this internship period I learned many new things that was out of my core and is well satisfied with the outcome