

Smt.Kandukuri Rajyalakshmi Government Degree College (W),  
Rajamahendravaram, East Godavari District, Andhrapradesh.

23/11/2022

From

The Principal,

Smt. Kandukuri Rajya Lakshmi College for Women,  
Rajamahendravaram.

To

The Manager,

Ground Water Department,  
Rajamahendravaram.

Sir,

Sub: - Requisition for Permission to visit the ground water department. - submitting - reg.

As a part of academic curriculum Field trip to students is mandatory. In this connection it is to bring to your notice that our college students of III B.Sc wish to visit the ground water department.

Hence, request you to permit our students (50 Number) and staff members (5 Number) to visit the same

Thanking you,



Yours sincerely

*P. M. S.*  
PRINCIPAL

E.K.R. Government Degree College (Women)  
RAJAMAHENDRAVARAM,  
East Godavari Dist., Andhra Pradesh

*Accepted*  
*[Signature]*  
23/11/22

## LIST OF BZC EM STUDENTS

1	P. Meghana reddy	P. Meghana Reddy
2	M. Srihitha	M. Durga Srihitha
3	K. Bhavani	K. Bhavani
4	CH. Deepika	Ch. deepika
5	M. Priyanka	M. Priyanka
6	N. Bhavana	N. Bhavana
7	K. Sravani	K. Sravani
8	N. Swathi	N. Swathi
9	P. Bharathi lucky	P. Bharathi lucky
10	CH. Srilakshmi	Ch. Sri lakshmi
11	T. Sravanthi	T. Sravanthi
12	P. Kusuma Bhargavi	P. Kusuma Bhargavi
13	M. Niharika	M. Niharika
14	G. pasanna	G. pasanna
15	P. Aruna	P. Aruna
16	CH. Sonia	Ch. Sonia
17	D. Sravya keerthi	D. Sravya keerthi
18	S. Bhargavi	S. Bhargavi
19	CH. Varalakshmi	Ch. Varalakshmi
20	A. Keerthana	A. Keerthana
21	B. Satya	A. Keerthana B. satya
22	T. Sneha Bharathi	T. sneha bharathi
23	K. Lahari	K. Lahari
24	K. Veni sri devi	K. Veni
25	S. Alekya	S. Alekya
26	S. Vandana	S. Vandana
27	V. Pranitha	V. Pranitha
28	A. Pravallika	A. pravallika
29	K. Sravani	K. Sravani
30	S. Neeraja devi	S. Neeraja devi
31	M. Shyni	M. Shyni
32	B. Navya	B. Navya
33	V. Harika	V. Harika
34	E. Teja sri	E. Teja sri

## LIST OF BZC TM STUDENTS

1	JAGANNADHAM SWARNA	J. Swarna
2	TURRAM SANDHYA RANI	T. Sandhya Rani
3	VARA MADHURIMA	V. Madhurima
4	TURRAM RANJITHA	T. Ranjitha
5	TURRAM KAVYANJALI	T. Kavyanjali
6	PODIYAM SUNITHA	P. Sunitha
7	PENUMUNCHI MOUNIKA	P. Mounika
8	SEERSAM POSAMMA	S. Posamma
9	PATARA CHANDINI	P. Chandini
10	NAKKA SWATHI	N. Swathi
11	MIDIYAM PAVANI DURGAMBICA	M. Pavani Durgambica
12	KOTHAPALLI SANGEETHA	K. Sangeetha
13	KIMUDU PRAMEELA	K. Prameela
14	KATHETI LALITHA	K. Lalitha
15	GURUVELLI GIRIJA	G. Girija
16	GADI JAYASRI	G. Jayasri
17	CHODI UMA NAGA MALLESWARI	Ch. Uma naga malleswari
18	CHODI LAKSHMI KALYANI	Ch. Lakshmi Kalyani
19	CHODE NAGAMANI	Ch. Nagamani
20	CHITTIRI APARNA	Ch. Aparna
21	CHEELI RESHMA	Ch. Reshma
22	BEERABOINA DURGABHAVANI	B. Durgabhavani
23	BATTINA KRUPA RATNAM	B. Krupa Ratnam
24	BATHINA DEEPIKA	B. Deepika
25	BABY YANGALA	Y. Baby
26	NARSI BALA TRIPURA SUNDARI DEVI	N.B.T.S. Devi
27	SUNNAM VENKATA LAKSHMI	Sunkatalakshmi
28	PODIYAM POSIVENI	P. Posiveni
29	SURYA TEJASRI SIRASAM	S. Tejasri

**S.K.R GOVERNMENT DEGREE COLLEGE  
FOR WOMEN**

**RAJAMAHENDRAVARAM**

**WATER ANALYSIS**

DEPARTMENT OF CHEMISTRY

Head of the Department of Chemistry: Dr.M.Sunitha

Student Profile

Name of the student: Surla Pavani

Class: 3<sup>rd</sup> B.Sc. (MPC)

Register no. :200907101023

Name of the Mentor: V.B.T. SUNDARI

Designation: Lecturer in chemistry

Project: Water Analysis



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## REPORT:

I'm Surla Pavani student of III B.Sc.(MPC) in SKRGDCW. This project was done on 26 November under the mentor-ship of Dr.M.Sunitha Department of Chemistry. I learned that how to check quality of water through different i.e., pH, EC, Hardness, TDS of water using analog and digital instruments.





S.R. GOVERNMENT DEGREE COLLEGE (W)



RAJAMAHENDRAVARAM

DEPARTMENT OF CHEMISTRY  
CERTIFICATE

This is to certify that Ms./Smt. Surla Parni student of 3<sup>rd</sup> BSC(MFC) Reg No. 200907101023 has successfully completed an field project work on Water analysis on 25<sup>th</sup> Nov 2023 at Ground Water And Water Audit Department Doulesuram Under the guidance of Dr. M. Sunitha Head of the department of the Chemistry

Certified by

Lecturer in Chemistry

Internal Examiner (Mentor)

Principal

## ACKNOWLEDGEMENT

It is with a profound sense of gratitude and respect that I express my thanks to my research supervisor V. B. T. Sundari , Lecturer, Department of Chemistry, SKRGDCW, for her valuable guidance, suggestions, and constant encouragement to complete this piece of research work successfully.

I am extremely thankful to the authorities of SKRGDCW, especially Prof. Dr. P. Raghavakumari , Principal, SKRGDCW for all the help and encouragement rendered for the completion of the course on time.

I am grateful to Dr. M. Sunitha , Head of, the Department of Chemistry, SKRGDCW , for providing all necessary facilities and for her encouragement, for conducting this research, which has enabled me to complete this study successfully.

I also thank N. Swathi, sravani lecturers in chemistry, SKRGDCW for their support on all occasions.

I thank all the Office, Laboratory, and Non-teaching staff in the Department of Chemistry for their constant support during the tenure of my project work.



## DECLARATION

I hereby declare that this Bsc dissertation entitled "**WATER ANALYSIS**" my own work under the supervision of Dr. M. Sunitha , Lecturer Department of Chemistry, SKRGDCW is original and has not been submitted for any other Degree or Diploma either in part or full anywhere.

*S. Pavan*  
Signature of the student

## INTRODUCTION:

I am Surla.Pavani. Studying in 3rd BSC(MPC). On 26th November 2022 i went to field project at Government of AP,. GROUNDWATER AND WATER AUDIT DEPARTMENT office of the deputy director, Dowleswaram, Rajahmundry. The staff was very friendly they explained very well and clarified all doubts clearly through the practical and we learnt about some instruments such as PH meter, Electric conductivity meter (EC Meter), Flame photo meter, Portable meter, Salinity meter. These are all digital instruments and we learnt about Total dissolved solids (TDS) with titrations. I took my area ground water sample for field trip and tested the PH, Electric Conductivity, TDS and

1. The compounds of the alkali and alkaline Earth Metals (Group) dissociate into atoms when introduced into the Flame
2. Some of these atoms further get excited to even higher levels but these atoms are not stable at higher levels.
3. Hence these atoms emit radiations when returning back to the ground state these radiations Generally, lie in the visible region of the spectrum each of the alkaline Earth-Metals has a specific Wave length.
4. For certain concentration ranges the intensity of the emission is directly proportional to the number of atoms returning to the ground state and the light emitted is in turn proportional to the concentration of the Sample.

Both the standard Stock solution and sample solution are prepared in fresh distilled water.

- We can detect Sodium and potassium by using flame photometer.
- Observation: Sodium - 73.86

Element	Emitted wavelength	Flame colour
POTASSIUM(K)	766nm	Violet
LITHIUM(Li)	670nm	Red
CALCIUM(Ca)	622nm	orange
SODIUM (Na)	589nm	Yellow
BARIUM (Ba)	554nm	Lime Green



## TOTAL DISSOLVED SALTS (TDS):

**Total dissolved solids (TDS)** is a measure of the dissolved combined content of all inorganic and organic substances present in a liquid in molecular, ionized, or micro-granular (colloidal sol) suspended form. TDS concentrations are often reported in parts per million (ppm). Water TDS concentrations can be determined using a digital meter or by titration. In this test we can detect the percentage of Bi-carbonate, Chloride, Sulphate, Fluoride, Calcium, Magnesium.



### **Carbonate:**

Burette: 0.02N (Sodium Hydroxide), Conical flask: 10ml sample, Indicator: 1 or 2 drops of Phenolphthalein

Titration: pink to colourless



Carbonate: End point\*200

Limits: 200 -600ppm

### **Bi-Carbonate:**

Burette: 0.02N (Sodium Hydroxide), Conical flask:  
10ml sample, Indicator: BromoCrysol Green,

Titration: Green to pink

Bi-Carbonate: Endpoint\*100 factor.

Limits: 200 to 600 ppm

**Calculation:** Initial value -9.4 Final value -12.7

**End point:**  $12.7 - 9.4 = 3.3$

**Bi-Carbonate:**  $3.3 * 100 = 330 \text{ ppm}$

### **Chloride :**

Burette: 0.02N (Silver Nitrate)





3. The principle of flame photometer is based on the element and the colour of the flame given information about the amount of the element present in the sample.
  4. Flame Photometer is one of the branches of Atomic Absorption Spectroscopy.
  5. It is also known as Flame Emission Spectroscopy.
  6. Currently it has become a necessary tool in the field of Analytical Chemistry
  7. Flame Photometer can be used to determine the concentration of certain metal ions like Sodium, lithium, Calcium and Cesium etc.
  8. In Flame Photometer Spectra the metal ions are used in the form of atoms.
- PRINCIPLES OF FLAME PHOTO METER**

## **Flame Photometer :**

Introduction:

1. During 1980 bowling Barner, David Richardson john Berry and Robert Hood development an instrument to measure the low concentration of sodium and potassium in a solution.
2. Named this instrument as flame photo meter.



Calcium: EDTA\*80

Limits:75-200

**Calculation:** Initial value -4.1 Final value -5.4

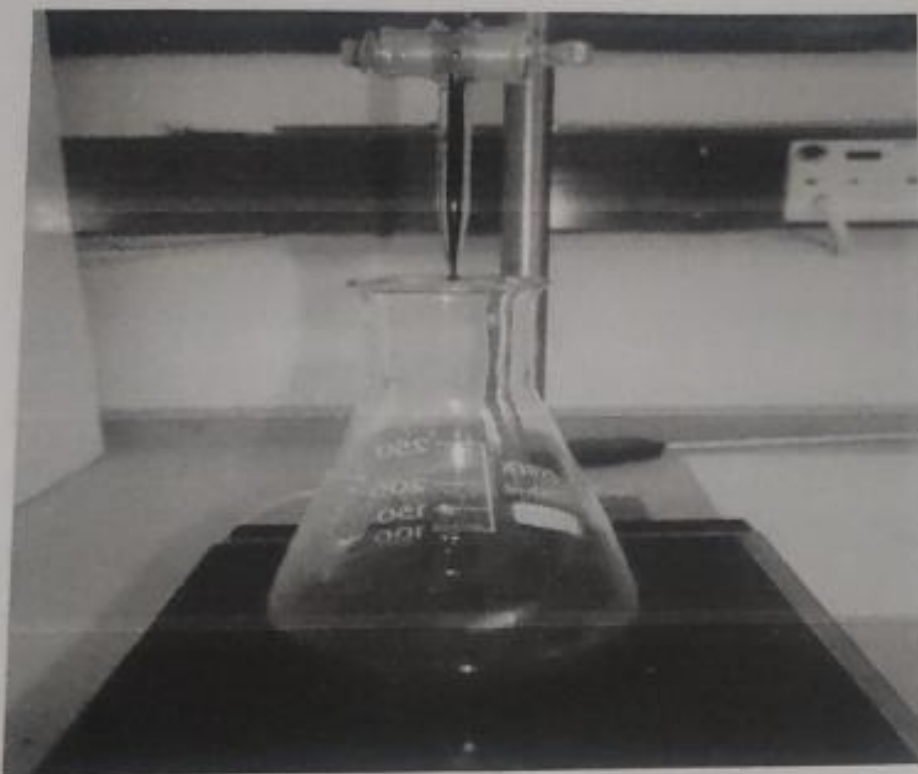
**End point:** $5.4 - 4.1 = 1.3$

**CALCIUM** $= 1.3 * 80 = 104 \text{ ppm}$

Magnesium: $(\text{EDTA-1} - \text{EDTA-2}) * 48.62$

Limits:30-100

**Calculation:** $(\text{EDTA-1} - \text{EDTA-2}) * 48.62$



**Calculation:** Initial value -3.8 Final value – 4.1

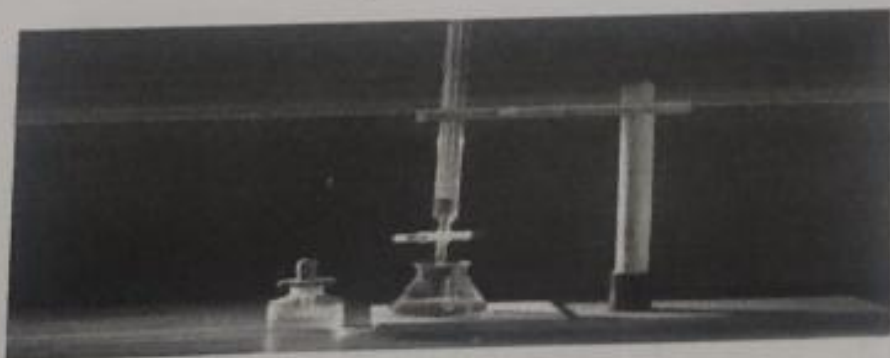
**End point:**  $4.1 - 3.8 = 0.3$

**Total Hardness = EDTA-1 \* 200 factor =  $0.3 * 200 = 60$**

**EDTA-2:**

**Burette:** Ethyl Diamine Tetra Acetic acid

**Buffer:** 1 or 2 drops of NaOH, **indicator:** Methoxide  
**Powder-** 1/2 spatula, **Titration:** pink to violet





**pH Meter:** A **pH meter** is a scientific instrument that measures the hydrogen-ion activity in water-based solutions, indicating its acidity or alkalinity expressed as pH. The pH meter measures the difference in electrical potential between a pH electrode and a reference electrode, and so the pH meter is sometimes referred to as a "potentiometric pH meter". The difference in electrical potential relates to the **acidity or pH** of the solution and **temperature** of the sample. Testing of pH via pH meters (**pH-metry**) is used in many applications ranging from laboratory experimentation to quality control.



**Procedure:** Step1: We have to calibrate to remove errors with three types of solution(buffer solution) in 40seconds.  
Step2: Now we can test the pH of the sample.



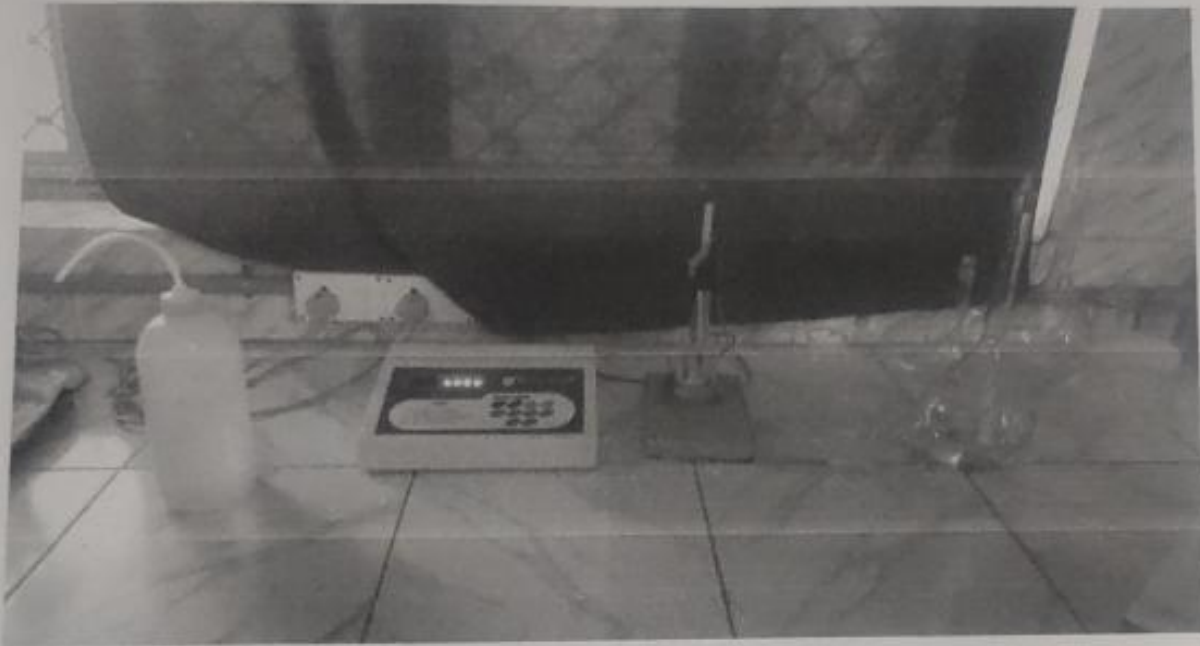
Range: 6.5 to 8.5

Observation:

Sample -1	6.07
Sample-2	6.14

Electrical conductivity:

An **electrical conductivity meter (EC meter)** measures the electrical conductivity in a solution. It has multiple applications in research and engineering, with common usage in hydroponics, aquaculture, aquaponics, and freshwater systems to monitor the amount of nutrients, salts or impurities in the water.



Procedure: step 1: calibrate with kcl solution.

Step 2: Now we can test electrical conductivity.

Note: electrical conductivity = E.C. \* 0.64

Range: 500 to 2000

**Observation:**

Sample 1	E.C -582
Sample 2	E.C-180

**FLOURIDE TEST:**



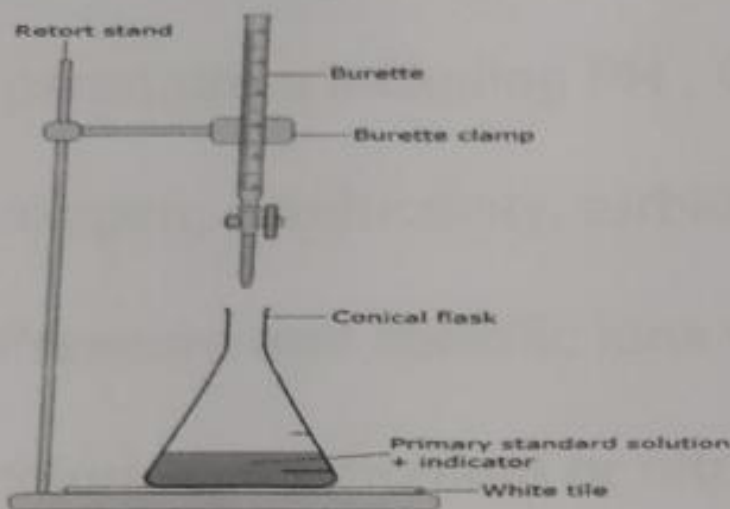
Procedure: Calibrate and test the sample it takes 20-30 minutes to detect fluoride.

Range: 1.0 to 1.5



Conical flask: 10ml sample, Indicator: Potassium Chromate (yellow), Titration - yellow to Brick red

Chloride:  $\text{Endpoint} \times 100$ , Limit: 250 to 1000



**Calculation:** Initial value - **8.8** Final value - **10**

**End point:**  $10 - 8.8 = 1.2$

**Chloride:**  $1.2 \times 100 = 120 \text{ ppm}$

**EDTA-1:**

Burette: 0.02N Ethylene Diamine Tetra Acetic Acid

(buffer-Ammonia), conical flask: 10 ml sample,

Indicator: Eriochrome Black T Titration: Pink to blue.

**PORTABLE METER:** Multi parameter portable meters have the ability to measure multiple parameters including PH , ORP, Dissolved oxygen, conductivity, turbidity, Temperature, Pressure and specific ions with the use of either chloride ,ammonium or nitrate ISE.

**SALINITY METER:** Salinity Meters are devices that are used to measure the amount of salt present in a substance. It is a 6 in 1 meter which measures PH, Electric Conductivity, ORP, Salinity, Temperature and TDS.



sodium, potassium with flamephoto meter for my sample

## **INSTEUMENTS:**

PH METER: A PH meter is an instrument used to Hydrogen activity in solutions.

EC METER: Electric conductivity meter allows us to Measure the level of conductivity in solutions.

FLAME PHOTO METER: Flame photo meter is an analytical instrument used for determining of sodium, potassium , Lithium and calcium ions in body fluids.

Potassium-51.95

