ملخص
لاب بيئة
محمد السفريني

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لجنة المدني
#سيفلتي
#محمد_السفاريني
• EXPERIMENT #1: DETERMINATION OF CHLORID
Q1- What is the **purpose** for this experiment?
Ans: To determine the chlorides concentrations present in given water sample.

Q2- Why is the salty taste produced by chloride concentrations is **variable**?
Ans: Dependent on the chemical composition of water.

Q3- What is The **major** taste producing salts in water?
Ans: Sodium chloride and calcium chloride.

Q4- The **salty taste** from?
Ans: Chloride anions and associated cations in water.
Q5- When Sodium Chloride exert salty taste?
Ans: when its concentration is more than 250 mg/L.

Q6- What is the limit of chloride concentration in public water supplies?
Ans: 250 mg/L.

Q7- Why the typical salty taste may be absent even if the water is having very high chloride concentration for example 1000 mg/L?
Ans: The predominant cation present in the water is not sodium but either calcium or magnesium may be present.
Q8- Why we can use sources containing as much as 2000 mg/L are used for domestic purposes without the development of adverse effect?
Ans: The human system becomes adapted to the water and in many areas of the world where water supplies are scarce.

Q9- Why we measured chloride ions?
Ans: 1- Know salinity of different water sources
2- Determine the type of desalting of apparatus required
3- Control pumping of ground water
4- It also interferes with COD determination.
Q10- How we can **determined** The amount of chloride present in water?
**Ans**: Titrating the given water sample with **silver nitrate** solution.

Q11- When the **silver chromate** **(AgCl)** precipitate is form?
**Ans**: After all the chloride has been precipitated as white silver chloride.

Q12- When the **first** excess of titrant results?
**Ans**: Formation of a **silver** chromate precipitate.

Q13- When we indicate the **end of titration**?
**Ans**: Formation of **red** silver chromate**(Ag₂CrO₄)**.
Q14- What is the **indicator** in this experiment?

**Ans :** Potassium Chromate

Q15- If we add Potassium Chromate what the **color** we will get?

**Ans :** Yellow

**Q16-** What is the **End point**?

**Ans :** Changing the color from yellow to brick red.

Q17- What the **Reactions** in this experiment will happened?

**Ans :**

\[
\begin{align*}
Ag^+ + Cl^- & \leftrightarrow AgCl(s) \\
2Ag^+ + CrO_4^{2-} & \leftrightarrow Ag_2CrO_4(s)
\end{align*}
\]
Figure 1.15: Apparatus required for Chloride experiment

Figure 1.16: Procedure of Chloride experiment
Volume of sample and the Reading (Initial and Final) are given.
Chlorides \( \left( \frac{mg}{l} \right) \) :

\[
\frac{(V_s - V_b) \times \text{Normality} \times 35.45 \times 1000}{\text{Volume of Sample taken (ml)}}
\]

For convert ml to L = ( * 1000 )

\[
V_s = \frac{v_1 + v_2}{2}
\]

Normality = 0.0282
Q1. In the determination of chloride experiment, fill the burette with ............... solution.

- silver nitrate
- EDTA
- sulphric acid
- sodium thiosulphate
Q2. Silver nitrate is the chemical required in titration for the determination of:

a. chloride
b. total hardness
c. calcium hardness
d. residual chlorine

Q3. In the determination of chloride experiment, when we reach the end point, the color of sample is:

a. blue
b. brick red
c. yellow
d. black
• EXPERIMENT #2: DETERMINATION OF RESIDUAL CHLORINE
Q1- What is the **purpose** for this experiment?
   Ans: determine the amount of total residual chlorine present in the given sample of chlorinated water.

Q2- What is the **water chlorination**?
   Ans: Process of adding chlorine as a gas (Cl₂) or (NaOCl) or Ca(OCl)₂ to water.

Q3- Why we **use** water chlorination?
   Ans: to kill certain bacteria and other microbes in tap water.
Q4- When we **use** chlorination?

**Ans**: destroy or deactivate disease-producing microorganism in the public water supplies and polluted water.

Q5- What is **chlorine demand** of the water?

**Ans**: some of the chlorine reacts first with organic materials and metals in the water and is not available for disinfection.
Q6- What is the Total chlorine?
Ans: The remaining chlorine concentration after the chlorine demand.

Q7- How much section is divided the Total chlorine?
Ans: Combined chlorine and Free chlorine.

Q8- What is the combined chlorine?
Ans: The amount of chlorine that has reacted with nitrates and is unavailable for disinfection.

Q9 - What is the free chlorine?
chlorine available to inactivate disease-causing organisms, and thus a measure to determine the potability of water.
Q10- **When** Chlorine will liberate free Iodine from Potassium Iodide solution?
Ans : at pH 8.0 or less

Q11- What is the **indicator** ?
Ans : starch

Q12- What is the **Titrate** component ?
Ans : standard sodium thiosulphate

Q13- Why we add **Acetic acid** ?
Ans : to bring pH (3.0 to 4 )
Q14- What happened if we add potassium iodide?
   Ans: Yellow color is obtained

Q15- What is the End point?
   Ans: Disappearance of blue color
Figure 2.17: Apparatus required for Residual chlorine experiment

Figure 2.18: Procedure for Residual chlorine experiment

Sodium Thiosulphate

$\text{Na}_2\text{S}_2\text{O}_3$ (0.025N)

200ml of sample
+ 5ml of Acetic acid
+ 1g of KI
+ 1ml of starch indicator
Volume of sample and the Reading (Initial and Final) are given.

<table>
<thead>
<tr>
<th>Sample</th>
<th>Volume of sample (ml)</th>
<th>Burette Reading (ml)</th>
<th>Volume of Titrant (ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>20ml</td>
<td>Initial: 17.5</td>
<td>Final: 18.3</td>
</tr>
</tbody>
</table>
Residual Chlorine = $\frac{\text{Volume of titrant} \times \text{Normality} \times 35.45 \times 1000}{\text{Volume of Sample taken (ml)}}$

$\text{Normality} = 0.01$

لأننا عوضنا الحجم ب ملي لتر
Q1. If there is no residual chlorine in your sample, then the color of sample when we put starch indicator is;
   - blue
   - straw yellow
   - orange
   **Colorless**

Q2. Acetic Acid was added in residual chlorine experiment to carried out with:
   - Neutral pH
   - pH (3-4)
   - pH (6-7)
   - pH (10-11)
Q3. The amount of residual chlorine in water should be:

- 0.2 ppm
- 2 ppm
- 2.5 ppm
- 4 ppm
• EXPERIMENT #3: DETERMINATION OF TOTAL HARDNESS
Q1- What is the **purpose** for this experiment?
**Ans**: To determine the hardness of the given sample by EDTA Titrimetric method.

Q2- What is the **hard water**?
**Ans**: Water that has high mineral content.

Q3- What is the **advantages** of hard water?
**Ans**: Useful to growth of children due to the presence of calcium and magnesium.

Q4- What is the **disadvantages** of hard water?
**Ans**: Scaling of hot water pipes, boilers.
2-cause’s excessive consumption of soap used for cleaning.
Q5- How we can determined the Total hardness?
   Ans : Determined by the multivalent cations' concentrations present in water

Q6- What is the most common cations present in hard water ?
   Ans : Mg2+ and Ca2+

Q7- What is the Total hardness ?
   Ans : the sum of the calcium and magnesium concentrations
Q8- What is the scale?
Ans: hard water is heated, Ca$^{2+}$ ions react with bicarbonate (HCO$_3^-$) ions to form insoluble calcium carbonate (CaCO$_3$).

Q9- What is the effect of the scale?
Ans: coats the vessels in which the water is heated, producing the mineral deposits on your cooking dishes.

Q10- What is the reaction happened in this experiment?
Ans:
\[
\begin{align*}
Ca^{2+}_{(aq)} + 2HCO_3^-_{(aq)} &\rightleftharpoons CaCO_3(s) + CO_2_{(aq)} + H_2O(l) \quad \text{Eq. 1} \\
Mg^{2+}_{(aq)} + 2OH^-_{(aq)} &\rightleftharpoons Mg(OH)_2(s) \quad \text{Eq. 2}
\end{align*}
\]
Q11- What is the indicator?  
**Ans:** EBT indicator

Q12- What is the **Titrate** component?  
**Ans:** EDTA(Ethylene diamine tetraacetic acid)

Q13- What happened if we **add** EBT indicator?  
**Ans:** Sample turns to wine red in color. 4

Q14- What is the **End point**?  
**Ans:** Changing color from wine red to blue
EDTA (0.02N)

20ml of sample
+ 2ml of buffer solution
+ 2drop of BBT indicator

Burette stand
Conical Flask
Burette
Funnel
Pipette
Measuring Cylinder
Q1. In total hardness experiment, add 2 ml of ammonia buffer to make NaOH react with Mg$^{2+}$ ions
   maintain the PH between 9 & 10
   make NaOH reacts with ca$^{2+}$
   maintain the PH between 3 & 4

Q2. Scale formation caused by:
   Chlorination
   Alkalinity
   Acidity
   Hardness
• EXPERIMENT #4: DETERMINATION OF CALCIUM HARDNESS
Q1-What is the **purpose** for this experiment?
   **Ans:** To determine the calcium hardness of the given sample by EDTA Titrimetric method.

Q2-What is the **Calcium hardness**?
   **Ans:** Estimation of hardness due to calcium in water.

Q3- The **presence** of calcium in water?
   **Ans:** Results from deposits of lime stone, gypsum.
Q4- These cations form ?
Ans: insoluble salts with soap and decrease the cleaning effectiveness of soap.

Q5- What is the indicator ?
Ans: Ammonium Purpurate

Q6-What is the Titrate component ?
Ans: EDTA(Ethylenediaminetetraacetic acid)

Q7-Whats happened if we add EBT indicator ?
Ans: he sample turns into pink color

Q8- What is the End Point ?
Ans: Changing color from pink red to purple
EDTA (0.02N)

20ml of sample
+ 2ml of sodium hydroxide
+ pinch of ammonium purpurate indicator
<table>
<thead>
<tr>
<th>Sample(#)</th>
<th>Volume of sample (ml)</th>
<th>Initial Burette Reading (ml)</th>
<th>Final Burette Reading (ml)</th>
<th>Volume of EDTA (ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>20ml</td>
<td>0.8</td>
<td>12.7</td>
<td>12.7 - 0.8 = 11.9</td>
</tr>
<tr>
<td>2</td>
<td>20ml</td>
<td>12.7</td>
<td>21</td>
<td>21 - 12.7 = 8.3</td>
</tr>
<tr>
<td>Blank</td>
<td>20ml</td>
<td>21</td>
<td>27</td>
<td>27 - 21 = 6</td>
</tr>
</tbody>
</table>

Volume of sample and the Reading (Initial and Final ) are given.
• Total Hardness = $\frac{\text{Volume of EDTA} \times \text{Normality} \times 50 \times 1000}{\text{Volume of Sample taken (ml)}}$

• To **convert** from ml to L (*1000*)

Normality = 0.02
<table>
<thead>
<tr>
<th>Sample(#)</th>
<th>Volume of sample (ml)</th>
<th>Burette Reading (ml)</th>
<th>Volume of EDTA (ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Initial</td>
<td>Final</td>
</tr>
<tr>
<td>1</td>
<td>20ml</td>
<td>4</td>
<td>5.6</td>
</tr>
<tr>
<td>2</td>
<td>20ml</td>
<td>6.4</td>
<td>9</td>
</tr>
<tr>
<td>Blank</td>
<td>20ml</td>
<td>9</td>
<td>11.3</td>
</tr>
</tbody>
</table>

Volume of sample and the Reading (Initial and Final) are given.
• **Calcium Hardness** = \( \frac{\text{Volume of EDTA} \times \text{Normality} \times 50 \times 1000}{\text{Volume of Sample taken (ml)}} \)

• To **convert** from ml to L \((\times 1000)\)

• **Calcium present in the sample** = \( \frac{\text{Ca Hardness} \times \text{Molecular weight of Ca}}{\text{Molecular weight of CaCO}_3} \)

• **Magnesium Hardness** = Total Hardness – Calcium Hardness

• **Magnesium present in the sample** = \( \frac{\text{Ma Hardness} \times \text{Molecular weight of Ca}}{\text{Molecular weight of CaCO}_3} \)
Notes:

1- Ca Hardness and Ma Hardness in $\frac{mg}{l}$ as CaCO$_3$
2- Molecular weight of Compounds are given.
3- Total Hardness we found it from Experiment 3.
Q1. A natural water with a hardness of 150-300 mg/L is
   soft water
   moderately hard
   hard
   very hard

Q2. In the calcium hardness experiment, add 2 ml of ............ to maintain the pH between 12 & 13;
   ammonia buffer
   sodium hydroxide
   methyl orange
   phenolphthalein
Q3. In calcium hardness experiment Sodium hydroxide was added to sample to:

Precipitate out Mg(OH)₂
Precipitate out Ca(OH)₂
Adjusting pH value
Reducing error
EXPERIMENTS #5: DETERMINATION OF ALKALINITY
Q1- What is the purpose for this experiment?
   Ans: Determine phenolphthalein alkalinity and total alkalinity of given water sample.

Q2- What is the Alkalinity?
   Ans: capability of water to absorb H+ ions or to neutralized acid (ANC) without significant change of pH. Or alkalinity is a measure of the acid buffering capacity of water.

Q3- The ability of natural water to act as a buffer is controlled in?
   Ans: the amount of calcium and carbonate ions in solution.

Q4- Why the water will contain high levels of both Ca+2 and CO32– ions and have elevated hardness and alkalinity?
   Ans: Water that comes in contact with limestone.
Q5- What is the **unit**?  
**Ans:** mg/l as CaCO3.

Q6- Alkalinity of a sample of water is **due to**?  
**Ans:** presence of OH– (hydroxide ion), HCO3– (bicarbonate ion) and CO32– (carbonate ion) or the mixture of two ions present in water.

Q7- The possibility of OH– and HCO3– ions together is **not possible**?  
**Ans:** since they combine together to form CO32– ions

Q8- The **determination** of alkalinity of water is **necessary**?  
**Ans:** A- Controlling the corrosion

B- Important for fish and aquatic life because it protects or buffers against rapid pH changes.
Q9- **Effect** for Higher alkalinity levels in surface waters?

*Ans:*  
A- buffer acid rain and other acid wastes  
B- prevent pH changes that are harmful to aquatic life.
For the pH more than 8.3 need two step of titration:

<p>"pH more than 8.3"</p>

1- Firstly lowering pH to 8.3 using <strong>phenolphthalein indicator</strong> the color changes to <strong>pink</strong> color.

This pink color is <strong>due to</strong> presence of hydroxyl ions.

**Titrate** with <strong>sulphuric acid</strong> until <strong>pink color disappears</strong> (OH- ions are neutralized).

- This is the 1<sup>st</sup> end point (P alkalinity).
2- Then **Lowering pH to 4.5 using mixed indicator**, the presence of \( \text{CO}_3^{2-} \) and \( \text{HCO}_3^- \) ions in the solution changes the color to **blue**.

While adding **sulphuric acid**, the color changes to **red**, this color change indicates that all the of \( \text{CO}_3^{2-} \) and \( \text{HCO}_3^- \) ions has been neutralized.

- This is the 2\(^{nd} \) end point.

Q10. what is the **End point** in this experiment ?

**Ans** : **First** End point: Disappear of pink color .
**Second** End point: Changing color from Blue to Red .
Burette stand  

Burette  

Conical Flask  

Pipette  

Measuring Cylinder  

Sulpheric Acid  

$\text{H}_2\text{SO}_4 \ (0.02N)$  

100ml of sample  
+2 drops of pH indicator  
$$\text{Titrate}$$  
+2drps of MI  
$$\text{Titrate}$$
Q1. If pH > 8.3 titration steps needed are:

Lowering pH to 8.3 using Methyl Orange, then lowering pH to 4.5 using Phenolphthalein

Lowering pH to 8.3 using Phenolphthalein, then lowering pH to 4.5 using Methyl Orange

**Lowering pH to 8.3 using Phenolphthalein, then lowering pH to 4.5 using Mixed Indicator**

Lowering pH to 8.3 using Mixed Indicator, then lowering pH to 4.5 using Phenolphthalein
Q2. Acid neutralized capacity is definition of:

Chlorination

**Alkalinity**

Acidity

Hardness
## Explanation of the experiment in the fifth trial:

### Phenolphthalein indicator:

<table>
<thead>
<tr>
<th>Sample(#)</th>
<th>Volume of sample (ml)</th>
<th>Initial Burette Reading (ml)</th>
<th>Final Burette Reading (ml)</th>
<th>Volume of H2SO4(ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>100ml</td>
<td>30.6</td>
<td>31.1</td>
<td>31.1 - 30.6 = 0.5</td>
</tr>
<tr>
<td>2</td>
<td>100ml</td>
<td>31.1</td>
<td>31.3</td>
<td>21 - 12.7 = 0.2</td>
</tr>
</tbody>
</table>

**Phenolphthalein indicator:**

\[
V_p = \frac{V_1 + V_2}{2}
\]

### Mixed indicator:

<table>
<thead>
<tr>
<th>Sample(#)</th>
<th>Volume of sample (ml)</th>
<th>Initial Burette Reading (ml)</th>
<th>Final Burette Reading (ml)</th>
<th>Volume of H2SO4(ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>20ml</td>
<td>31.1</td>
<td>31.1</td>
<td>31.1 - 31.1 = 0</td>
</tr>
<tr>
<td>2</td>
<td>20ml</td>
<td>31.3</td>
<td>31.3</td>
<td>31.3 - 31.3 = 0</td>
</tr>
</tbody>
</table>

**Mixed indicator:**

\[
V_m = \frac{V_1 + V_2}{2}
\]
Phenolphthalein Alkalinity =

\[
\frac{(V_p) \times Normality \times 50 \times 1000}{Volume \ of \ Sample \ taken \ (ml)}
\]

Total Alkalinity =

\[
\frac{(V_p + V_s) \times Normality \times 50 \times 1000}{Volume \ of \ Sample \ taken \ (ml)}
\]

Normality : 0.02
Table 5.1: Combination of P and T alkalinity

<table>
<thead>
<tr>
<th>Value of P and T</th>
<th>Alkalinity due to</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OH⁻</td>
<td>CO₃²⁻</td>
<td>HCO₃⁻</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P=0</td>
<td>0</td>
<td>0</td>
<td>T = 83</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P&lt; ½ T</td>
<td>0</td>
<td>2P = 10</td>
<td>T-2P = 73</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P= ½ T</td>
<td>0</td>
<td>2P =10</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P&gt; ½ T</td>
<td>2P-T = -73</td>
<td>2P-T = -73</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P=T</td>
<td>T = 83</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

From **Results** use from the table to find Alkalinity
• EXPERIMENT #6: DETERMINATION OF ACIDITY
Q1- What is the **purpose** of this experiment?

**Ans:** To determine mineral and total acidity of given water sample.

Q2- What is the **Acidity**?

**Ans:** A measure of the capacity of water to neutralize bases. Acidity of water is its quantitative capacity to react with a strong base to a designated pH.

Q3- Acidity may be **caused** by mineral acids?

**Ans:** Such as sulfuric acid or hydrochloric acid or by dissolved carbon dioxide.
Q4- What is the **major** acidic component present?
**Ans:** Dissolved carbon dioxide (CO2)

Q- What is the **Mineral acidity**?
**Ans:** It is measured by titration to a pH of about 3.5, the methyl orange end point.

Q6- What is the **Total acidity**?
**Ans:** Titration of a sample to the phenolphthalein end point of pH 8.3 measures mineral acidity plus acidity due to weak acids.
Q7- What is the effects of high water acidity?

Ans:

- **Construction purposes**: reinforced concrete construction due to the corrosive nature of high acidity water.
- **Aquatic life**: The organisms present are prone to death with low pH of water.
- **People**: is not fit for drinking purposes.
Q8- What is the indicator?
Ans: methyl orange.

Q9- what happened if we add methyl orange?
Ans: The color changes to orange.

Q10- what is the titrate component?
Ans: sodium hydroxide solution

Q11- When we stop titrating?
Ans: until the orange color faints
Q12- what is the another indicator?  
Ans: phenolphthalein indicator

Q13- when we **stop** titrating?  
Ans: until the color changes to faint pink color.

Q14- What is the **End Point**?  
Ans:  
First End point: Changing color from Orange to yellow  
Second End point: Changing color to Pink
Sodium Hydroxide
NaOH (0.02N)

100ml of sample
+2 drops of Methyle Orange indicator
>>Titrate
+ 2drops of phenolphthalein
>>Titrate
## شرح الحل في التجربة السادسة:

### Determine with methyl orange indicator:

<table>
<thead>
<tr>
<th>Sample(#)</th>
<th>Volume of sample (ml)</th>
<th>Initial</th>
<th>Final</th>
<th>Volume of NaOH(ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>100ml</td>
<td>17.1</td>
<td>17.1</td>
<td>17.1 - 17.1 = 0</td>
</tr>
<tr>
<td>2</td>
<td>100ml</td>
<td>21.6</td>
<td>21.6</td>
<td>21.6 - 21.6 = 0</td>
</tr>
</tbody>
</table>

### Determine with phenolphthalein indicator:

<table>
<thead>
<tr>
<th>Sample(#)</th>
<th>Volume of sample (ml)</th>
<th>Initial</th>
<th>Burette Reading (ml)</th>
<th>Volume of NaOH(ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>100ml</td>
<td>17.1</td>
<td>21.6</td>
<td>21.6 - 17.1 = 4.5</td>
</tr>
<tr>
<td>2</td>
<td>100ml</td>
<td>21.6</td>
<td>25.5</td>
<td>25.5 - 21.6 = 3.9</td>
</tr>
</tbody>
</table>
Mineral Acidity =

\[
\frac{(Volume \ of \ NaOH) \times Normality \times 50 \times 1000}{Volume \ of \ Sample \ taken \ (ml)}
\]

Total Acidity =

\[
\frac{(Volume \ of \ NaOH) \times Normality \times 50 \times 1000}{Volume \ of \ Sample \ taken \ (ml)}
\]

From methyl orange

Normality = 0.02

From phenolphthalein indicator
Q1. In the acidity of water experiment, the sample is titrated against;
   a. Sodium thiosulphate
   b. sodium hydroxide
   c. silver nitrate
   d. ammonium purpurate

Q2. In the acidity of water experiment. After using methyl orange indicator only, you can calculate;
   total acidity
   mineral acidity
   phenolphthalein acidity
   total alkalinity
Q3. In the acidity of water experiment, the sample is titrated against:

- Sodium thiosulphate
- **sodium hydroxide**
- Silver nitrate
- Ammonium purpurate
• EXPERIMENT #7: DETERMINATION OF CONDUCTIVITY
Q1- What is the **purpose** of the experiment?
*Ans*: To determine the conductivity of given water sample.

Q2- What is the **Conductivity**?
*Ans*: a substance is the ability or power to conduct or transmit heat, electricity or sound.’

Q3- What happened if we electrical potential difference is placed across a conductor?
*Ans*: its movable charges flow, giving rise to an electric current.
Q4- Why we use this units **mS or μS** in most water?
**Ans:** the conductivity is very low

Q5- The water Suitable for **irrigation** has conductivity?
**Ans:** 2 mS/c

Q6- The conductivity of a solution is proportional to its ion concentration?
**Ans:** True
Q7- Where we can use conductivity data?
Ans: A - Decide the extent of intrusion of sea water into ground water.
B - Determining the suitability of water and wastewater for disposal on land.

Q8- The total dissolved solids are about 70% of the conductivity
Ans: True.

Q9- How we can measure Conductivity?
Ans: Probe and meter.
Q10- Why the **drop** in voltage happened?
**Ans**: Resistance of the water.

Q11- The meter converts the probe measurement to?
**Ans**: Micro mhos per centimeter.

Q12- How we can made **Calibration** of Conductivity Meter?
**Ans**: 0.1N Potassium Chloride.
Figure 7.1: Apparatus of Conductivity experiment
Q1. Electrical conductivity can be tested using a conductivity meter. This is:
   A-physical test
   B-chemical test
   C-biological test
   D-physical & biological test

Q2. Conductivity of a substance is defined as the ability or power to conduct or transmit.
   a. heat
   b. electricity
   c. sound
   d. all of the above
Q3. The total dissolved solids are about .............. of the conductivity.
   a. Seventy percent
   b. seventeen percent
   c. thirty five percent
   d. twenty percent

Q4. If we measure the conductivity of totally pure water, the closest result is .......... µS/cm:
   a. 0.1
   b. 0.055
   c. 0.5
   d. 50-100
Q5. ..................... the conductivity meter (at least 30 minute) before the test.

Switch off

Switch on

Calibrate

Read

Q6. The inverse of conductivity called:

Mohm

Mmho

Resistivity

Siemens/cm
Q7. Which one of chooses below is not effect to high electrical conductivity.

a. removing deep-rooted vegetation
b. flood irrigation of agricultural land
c. discharge of sewage effluent into waterways.

d. increased water temperature

Q8. The measurement of conductivity may lead the estimation of

A-Total solids
B-Total dissolved solids
C-Total suspended solids
D-Total colloidal solids
Q9. Prepare 0.1 N potassium chloride solution to calibrate the
a. turbidity meter
b. conductivity meter
c. spectrometer
d. all of them
• EXPERIMENT #8: DETERMINATION OF TURBIDITY
Q1- What is the **purpose** of the experiment ?
*Ans*: To determine the turbidity of the given water sample.

Q2- What is the **Turbidity** ?
*Ans*: Cloudiness of a solution and it is a qualitative

Q3- Turbidity often **indicates** ?
*Ans*: The presence of dispersed and suspended solids like clay.
Q4- Measurement of turbidity in settled water **prior to**?

**Ans:**

A- Checking on faulty filter operation.

B- Determine the optimum dosage of coagulants to treat domestic and industrial wastewaters and it is.

C- Evaluate the performance of water treatment plants.

Q5- Turbidity is **caused by**? What this **do**?

**Ans:** Suspended materials

A- Absorb and scatter light.

B- Causing materials do not settle and are difficult to remove by sedimentation.
Q6- The turbidity measured from?
Ans: the amount of light scattered by the sample.

Q7- The turbidity of the sample is measured using the?
Ans: Turbidity meter

Q8- light is focused and passed through the suspended particles?
Ans: True

Q9- The amount of scattered radiation is measured generally at 90° angle and displays?
Ans: True
Q10- The higher the intensity of scattered light the higher is the turbidity
Ans : True

Q11- The results in NTU (Nephelometric Turbidity Units).
Ans : True
Figure 8.2: Apparatus for Turbidity experiment
Q1. In the turbidity experiment, light absorbing materials can cause;
   a. high reading  
   b. low reading  
   c. constant reading  
   d. nothing  

Q2. ....................., is expected to have the highest turbidity.  
   a. tap water  
   b. irrigation water  
   c. ground water  
   d. sea water
Q3. The turbidity tube is rinsed with distilled water to:

a. To make the tube wet

b. To remove impurities around tube

c. To remove organism from sample

d. To prevent transmittance of light

Q4. The turbidity affects the aquatic life in the water

True
False
وكانت آخر دعواهم أن الحمد لله رب العالمين

#لجنة المدني
#سيفلتيي
#محمد_السفاريني