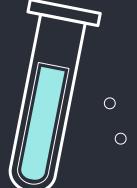




ALKALINITY OF WATER



Balancing Environmental Health

.



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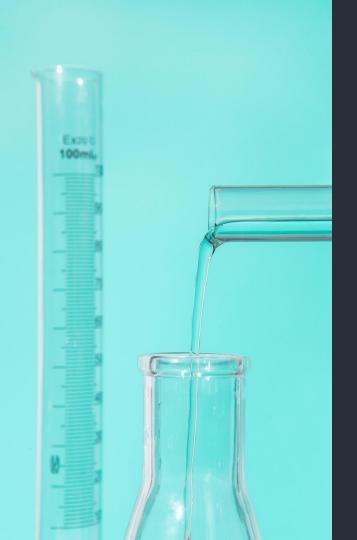
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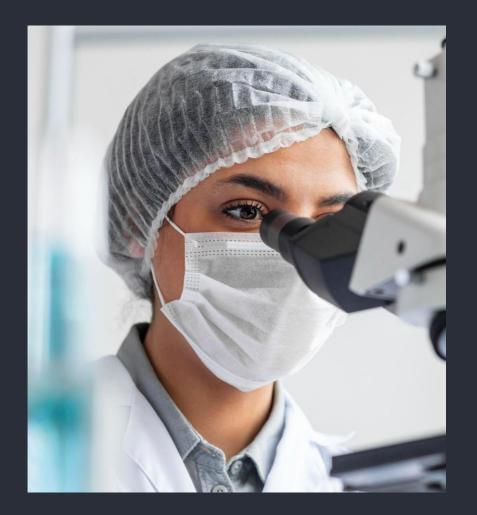




INTRODUCTION

A Brief Introduction about **Alkalinity**





ALKALINITY

- Alkalinity is a measure of how well water can neutralize acids.
- Unit Milligrams per Litre (mg/L) or Parts Per Million(ppm).
- High alkalinity can make water "hard"
- Low alkalinity makes water "soft" but more corrosive.



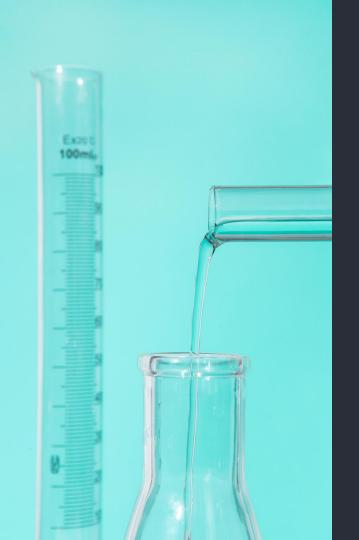


Introduction

- Alkalinity under 60 ppm indicate sensitive or unstable water. Over 100 ppm is desirable.
- There are 3 types of alkalinity based on anions present in water:
 - -Hydroxide Alkalinity occurs due to OH- Ion
 - Carbonate Alkalinity occurs due to CO3-2 Ion
 - Bicarbonate Alkalinity occurs due to HCO3- Ion

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PHENOLPHTHALEIN ALKALINITY

Determination of alkalinity using Phenolphthalein





Phenolphthalein Alkalinity

- It measures the total alkalinity due to hydroxide and carbonate ions.
- It is determined by titrating a water sample with phenolphthalein to an endpoint of pH 8.3.
 - Phenolphthalein is a suspected carcinogen, so it should be handled with care while conducting experiments.

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METHYL ORANGE ALKALINITY

Determination of alkalinity using Methyl Orange





Methyl Orange Alkalinity

- It measures the total alkalinity due to hydroxide, carbonate ions and bicarbonate ions.
- Methyl orange's chemical nature as an azo dye makes it a valuable pH indicator, transitioning between colours in the pH range of 3.1 to 4.4.
 - Due to its reactivity in a low pH range, methyl orange is not suitable for titrating highly alkaline o solutions.

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EXPERIMENT

Experimentation Process for determination of alkalinity





Materials Required

- Conical Flask
- Pipette
- Burette
- Standard HCL solution
- Phenolphthalein
- Methyl Orange
- Given Water Sample





Procedure

- Take 25mL of water sample in a titration flask and add 2-3 drops of phenolphthalein.
- Titrate it sample against HCL solution until pink colour produced by phenolphthalein just disappears
- Note down this reading as Phenolphthalein endpoint
- Now add 2-3 drops of methyl orange in same
 solution

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Procedure

- Continue Titration until yellow colour changes into orange
- Note the volume of acid used, this is methyl orange endpoint
- Use the table shown in previous slides to find out the new [P] and [M] and calculate hardness accordingly and hardness causing substance

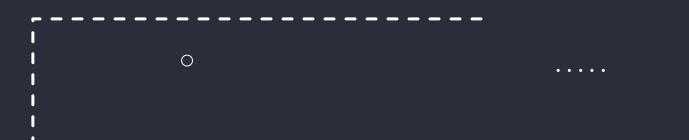
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ALKALINITY CHART

Result of Titration	OH-	CO ₃ ⁻²	HCO ₃ -
P=0			М
P=M	P=M		
$P=\frac{1}{2}M$		2P	
P> ¹ / ₂ M	2P-M	2(M-P)	
P <\frac{1}{2} M		2P	M-2P

 $N_1V_1 = N_2V_2$





WHOA!









"Nothing in life is to be feared, it is only to be understood. Now is the time to understand more, so that we may fear less."

-Marie Curie



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THANK YOU



MY REFERENCES

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Alkalinity and Water

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