Acid-Base titration using pH meter, And finding the Equivalence Point & NaOH Concentration



An acid/base titration can be monitored with an indicator or with a pH meter. In either case, the goal is to determine the equivalence point of the titration. This is the point at which enough titrant has been added to the analyte to just exactly neutralize the analyte. In this experiment, knowledge of the equivalence point will be used to obtain information about the acid dissociation constant, Ka, of the acid being titrated. When an indicator is used in a titration, the color change occurs at what is called the endpoint. If the indicator has been properly selected, this point will be the same as the equivalence point. When a pH meter is used, the pH of the solution is recorded as the titrant is added. The pH versus the volume of titrant added can be plotted on what is called a titration curve. In this case the equivalence point occurs at the point where very small additions of titrant cause a very rapid rise in the pH. Graphically, it is also the point on the curve where the slope, $\Delta pH/\Delta V$, changes from positive to negative (called the inflection point.).

What is are: Acid? Base? Types of Acid & Base? Acid-Base Reaction General Equation? Acid-Base Titration? Equivalence Point? Oxídation & Reduction? Electro Chemistry? Electrochemical Cell? Indicator & Reference Electrode? Electrode Potential? استئنامه الدراسة النظرية والعملية عن لعد [slass Electrode? pH (Combination) Electrode? ptt range? Acid: duutysti sigut An acid is a substance that generates hydronium ions, H₃O⁺

بي هذا العقر دعينا وتتريا أقد ن يقصر الكوميلية، ويشعل هذه في التسليقية، يتقديات، والترق وماتها منه يتعده أنابه، والتريز An *acid* is a substance that generates hydronium ions, H_3O^+ (often described as H^+), when added to water.

An *acidic solution* is a solution with a significant concentration of H_3O^+ ions.

Base:

A **base** is a substance that generates OH⁻ when added to water.

A **basic** solution is a solution with a significant concentration of OH⁻ ions.

Types of Acids and Bases:





Electrochemical Cell:





Page 6 of 8

Experimental:

1- Prepare 50ml Of [0.015M] of (HCl) from <u>Lab stock</u> with these information

[(Density=1.17g/ml) & (Purity=37% w/w)].

- 2- Pour [1] in suitable beaker. FAAS FAES GC GC-MS HPLC IEC ICP-CES ICP-MS ICP-R E FTIR & NVIR
- 3- Fill the burette with (25ml) of given (NaOH) solution.
- 4- Construct the system as shown in the photo below:



- 5- Merge the operated pH electrode in the (HCl) beaker and record the pH Value.
- 6- Drop (1 ml) of (NaOH) from the burette and record the pH Value-as instructed-.
- 7- Repeat step [7] till you pass the End Point by 3-4ml(1ml each time)..
- 8- Find the Equivalence & End Points and calculate the (NaOH) concentration.

