



3055 BA SANGAM COLLEGE

PH: 6674003/9264117 E-mail: basangam@connect.com.fj



WORKSHEET 8

School: Ba Sangam College

Year: 11

Subject: Chemistry

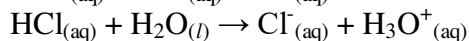
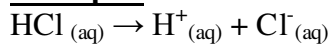
Name: _____

Strand	3 - Reactions
Sub strand	3.3 – Acids, Bases and Salt
Content Learning Outcome	Describe the differences between acids and bases.

Acids

Acids form hydrogen ions /protons (H⁺) or hydronium ions (H₃O⁺) in solution.

Examples



In general: **HA + H₂O → A⁻ + H₃O⁺**

Properties of Acids

- Have a low pH (below 7).
- Neutralises bases to form water and a salt.
- Have a sour taste.
- Changes blue litmus to red.
- React with many metals to produce hydrogen gas.

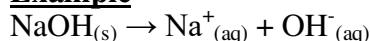
Examples of Acids:

- Hydrochloric acid (HCl), sulphuric acid (H₂SO₄) and nitric acid (HNO₃)
- Citric acid (in orange juice or lemon juice)
- Acetic acid (in vinegar)
- Phosphoric acid (in Coke)
- Ascorbic acid (in vitamin C tablets)
- Uric acid (in urine)
- Stearic and lauric acid (in cosmetics)

Bases/Alkalis

Form hydroxyl ions (OH⁻) in solution.

Example



In general: **BOH → B⁺ + OH⁻**

Properties of Bases/Alkalis

- Have a high pH (above 7).
- Changes red litmus to blue.
- Neutralises acids to form water and a salt.

- Have a bitter taste.
- Feels slippery.

Examples of Bases/Alkalis

- Ammonia
- Calcium hydroxide (caustic lime/lime water)
- Lithium hydroxide
- Potassium hydroxide (caustic potash)
- Sodium hydroxide (caustic soda)
- Many bleaches, soaps, toothpastes and cleaning agents
- Window cleaners may contain ammonia

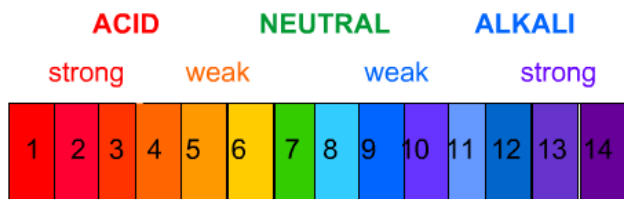
Exercise

Fill in the blanks

Acids have a _____ taste, react with metals to produce _____ gas, turn _____ different colours according to pH and are _____ because their water solutions conduct electricity. On the other hand, bases have a _____ taste, feel _____, turn _____ different colours according to pH and are _____ because their water solutions conduct electricity. **(8 marks)**

The pH Scale

- pH is a measure of how acidic or how alkaline a solution is.
- It is a scale for measuring hydrogen ion concentration.
- pH- p stands for 'potenz' in German meaning power and H- hydrogen.



Measuring the pH of a solution using the Universal Indicator

- The *Universal Indicator* is in liquid form and changes colour at different pH.

Steps in measuring the pH of a solution using the Universal Indicator.

- Take the test solution in a test tube. If there is a solid substance such as a salt then dissolve the solid by adding distilled water to it.
- Place a drop of the Universal Indicator using a fine dropper into the solution.
- Observe the colour produced and match it with the different colour shades of the standard colour pH chart.
- Note down the pH of the colour chart that matches most closely with the colour produced on the pH paper.

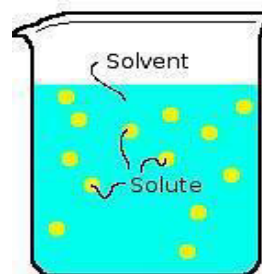
Strengths of Acids and Bases (ref: pg 71)

Acids		Bases	
Weak Acids	Strong Acids	Weak Bases	Strong Bases
Are acids which only partially ionise or dissociates in aqueous solution. Examples include: Acetic acid (CH_3COOH) and carbonic acid (H_2CO_3).	Are acids which completely dissociates into ions in aqueous solution. Examples include: HCl , H_2SO_4 , and HNO_3 .	Are bases which only partially ionise or dissociates in aqueous solution. Examples include: Ammonia (NH_3) and ammonium hydroxide (NH_4OH).	Are bases which completely dissociates in aqueous solution. Examples include: NaOH and KOH .

Solutions

A solution consists of a liquid (the solvent) with a substance (the solute) dissolved in it, eg, milk and ocean.

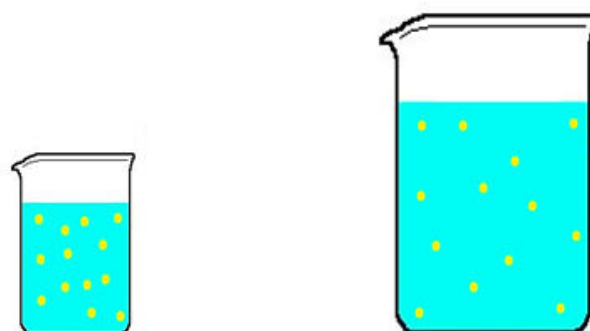
Sangam Education Board – Online Resources



Dilute and Concentrated solutions

- Dilution** involves adding more solvent to a solution so that the concentration of the solute becomes lower.
- The total number of solutes in the solution remains the same after dilution, but the volume of the solution becomes greater, resulting in a lower concentration.

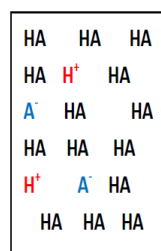
Example



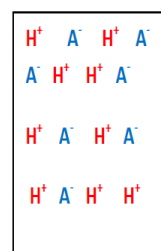
1 L
A concentrated solution

3L
A dilute solution

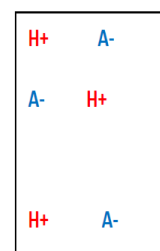
A Summary of Concentrated/Dilute solution of Strong/Weak Acid



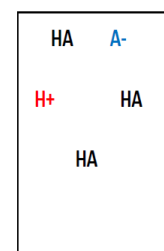
Concentrated solution of a weak acid



Concentrated solution of a strong acid



Dilute solution of a strong acid



Dilute solution of a weak acid

(ref: pg 72)

Exercise

- What is the difference between a strong acid and a weak acid? **(1 mark)**

- What is the difference between a strong acid and a concentrated acid solution?
