

Acids Bases and Salts Made Easy!!

Acid = formula starts with an H e.x. HCl, HNO ₃ , H ₂ SO ₄
Base = formula starts with a Metal and ends in -OH e.x. NaOH, Ca(OH) ₂ , Al(OH) ₃
Salt = formula starts with a Metal and ends with Non-metals e.x. NaCl, CaO, AlPO ₄

Properties of Acids:

H - NM

H - Cl HNO₃ H₂SO₄ etc

-taste _____

-are corrosive

-some foods are acidic e.x. _____

-turn blue litmus _____ "BRA"

-conduct electricity when dissolved in water

1) -react with **bases** to form salt and water $A + B \rightarrow S + W$

2) -react with **metals** to form hydrogen gas $A + M \rightarrow H_2$

3) -react with **carbonates** to form carbon dioxide gas $A + NaHCO_3 \rightarrow CO_2$

Rxn

Properties of Bases:

M - OH and NH₄OH (memorize this one!!)

-taste _____

ammonium hydroxide!

-feel _____

-most cleaners are bases

Net $CH_3CH_2OH = \text{alcohol}$

-are corrosive

CH_3OH

-turn red litmus _____

$C_xH_yOH = \text{alcohol}$

-conduct electricity in water

-react with acids to form salt and water $A + B \rightarrow S + W$

Properties of Salts:

M - NMs *eg MgO AlCl₃ Be₃N₂*

-conduct electricity in water

NaNO₃ etc

-neutral salts do not change the colour of litmus

-some salts can be acidic *∴ what do they do?*

-some salts can be basic

Problem:

You are given 4 bottles marked W, X, Y and Z.

All 4 contain clear, colourless solutions.

You are asked to determine which one is an acid, which one is a base, which one is a salt and which one contains only distilled water.

In the chart below fill in the tests you would perform and the results you would obtain if:

W = HCl

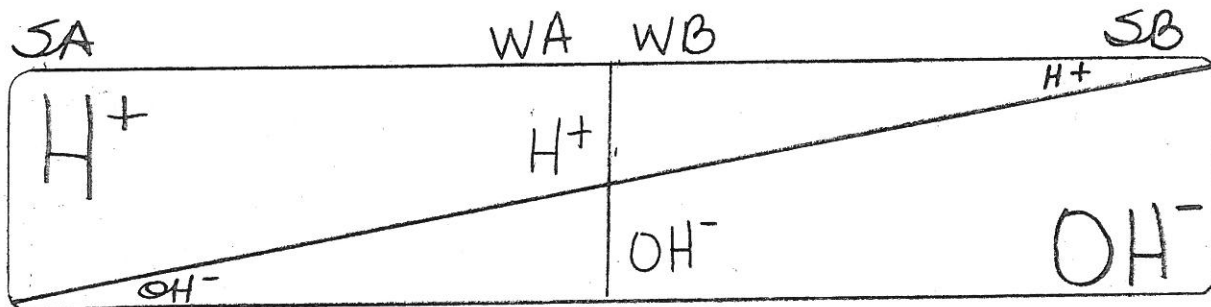
X = NaOH

Y = NaCl

Z = H₂O

W (HCl)					
X (NaOH)					
Y (NaCl)					
Z (H ₂ O)					

[H⁺]



pH 0

7

14

Acid Base Review

PHTH = phenolphthalein

BTB = bromothymol
blue

1. Some foods are _____.
2. Most cleaners are _____.
3. Bases turn _____.
4. Salts are made up of a _____ and a _____.
5. Acids produce _____ when dissolved in water.
6. Bases produce _____ when dissolved in water.
7. A pH of 5 indicates a _____ solution.
8. A pH of 13 indicates a _____ solution.
9. Acids react with _____ to produce hydrogen gas.
10. Acids react with _____ to produce carbon dioxide gas.
12. Acids react with _____ to produce _____ and _____.
- * 13. Indicators change _____ at different _____.
- * 14. The turning point of an indicator is really a _____.
15. The turning point colour of BTB which starts off yellow in acid and ends up blue is _____.
16. Turning points can occur anywhere on the _____.
17. A _____ can be from pH 3.4-6.2.
18. pH 7 indicates a neutral solution but it can still _____ electricity if it's a salt solution.
19. The $[H^+]$ increases in water when _____ is added to the water.
20. The $[OH^-]$ increases in water when _____ is added to the water.
21. Distilled water does not conduct electricity because it contains very few _____.
22. The concentration of H^+ ions in distilled water is _____ to the _____ ions.
23. A leftover beaker of acid could be _____ by adding _____ to it.

Electrolyte Demo

Electrolytes: -are substances that will conduct electricity when dissolved in water
 -are substances that form positive and negative ions in water
 -acids, bases and salts (ABS) form ions in water and, therefore, conduct electricity and are, therefore, electrolytes

Name	Formula	Is it an A or B or S?	Conducts	<i>None</i>
Table salt	NaCl(s)			<i>Na⁺/Cl⁻</i>
Table salt in water	NaCl(aq)			
Sugar	C ₁₂ H ₂₂ O ₁₁ (s)			
Sugar Water	C ₁₂ H ₂₂ O ₁₁ (aq)			
Ethanol	CH ₃ CH ₂ OH(l)			
Copper (2) nitrate	Cu(NO ₃) ₂ (aq)			
Hydrochloric acid	HCl(aq)			
Potassium hydroxide	KOH(aq)			
Methanol	CH ₃ OH(l)			
Sodium hydroxide	NaOH(aq)			
Pure Acetic Acid	HC ₂ H ₃ O ₂ (l)			
Vinegar	HC ₂ H ₃ O ₂ (aq)			
Sulfuric acid	H ₂ SO ₄ (aq)			
Windex (ammonia water)	NH ₄ OH(aq)			

1. What is absolutely necessary for an ABS to conduct electricity?
2. What must be present to conduct electricity?

Conclusion:

Acids: Contain an H covalently bonded to a nonmetal e.g. H_2SO_4

Turn _____ red. "BRA"

_____ electricity.

React with _____ to produce H_2 gas.

React with _____ to produce CO_2 gas.

Bases: Contain a metal ionically bonded to an OH group e.g. $\text{Ca}(\text{OH})_2$

Turn _____ blue.

_____ electricity.

Salts: Contain a metal ionically bonded to a nonmetal e.g. Al_2S_3

Some salts _____ change the colour of litmus paper.

_____ electricity.

Distilled Water: Does not _____ the colour of litmus paper.

Does not _____ electricity.

