

## Electrolytes Worksheet

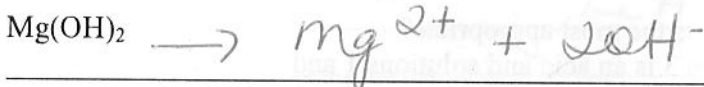
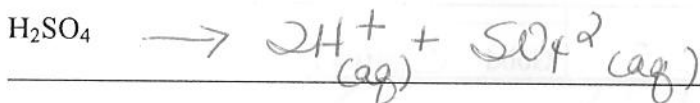
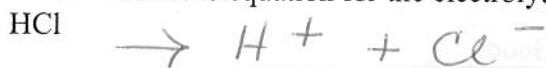
$A = H-NM = HCl$   
 $B = M-OH = NaOH$   
 $S = M-NM = NaCl$

1. What is an electrolyte? Give an example. ABS produce ions  
when dissolved in water!

2. Classify the following substances by type of electrolyte (acid, base or salt).

KOH	<u>B</u>	Ba(NO <sub>3</sub> ) <sub>2</sub>	<u>S</u>	KF	<u>S</u>
H <sub>2</sub> SO <sub>3</sub>	<u>A</u>	HNO <sub>3</sub>	<u>A</u>	Na <sub>2</sub> CO <sub>3</sub>	<u>S</u>
Mg(OH) <sub>2</sub>	<u>B</u>	NH <sub>4</sub> OH	<u>B</u>	Fe(OH) <sub>3</sub>	<u>B</u>
HCl	<u>A</u>	MgCl <sub>2</sub>	<u>S</u>	Ca(OH) <sub>2</sub>	<u>B</u>

3. Write the equation for the electrolytic dissociation of the following compounds:



}

in water!  
should all be (aq)<sup>-</sup>

4. To check the electrical conductivity of certain substances, a student used a conductivity apparatus equipped with a light bulb. Her observations are listed in the following table.

Which one of the following groups of substances contains only electrolytes?

Substances	Observations
HCl	Bright light
CH <sub>3</sub> OH <i>alcohol</i>	No light
MgCl <sub>2</sub>	Faint light
NaOH	Bright light
CH <sub>3</sub> COOH	Faint light
CCl <sub>4</sub>	No light

✓  
 X  
 ✓  
 ✓  
 ✓  
 X

alcohol ≠ base  
 C<sub>x</sub>H<sub>y</sub>OH = alc.

A) CH<sub>3</sub>OH and CCl<sub>4</sub>

B) HCl, MgCl<sub>2</sub> and CCl<sub>4</sub>

C) CH<sub>3</sub>OH NaOH and CH<sub>3</sub>COOH

D) HCl, MgCl<sub>2</sub>, NaOH and CH<sub>3</sub>COOH

5. Four chemical substances are given below.
1.  $H_2SO_4$                       2.  $Ca(OH)_2$                       3.  $MgCl_2$                       4.  $C_2H_5OH$
- Which of these substances is a base?
- A) Substance 1      B) Substance 2      C) Substance 3      D) Substance 4

6. A student must classify six aqueous solutions. The student knows that all except one of the solutions must be an ACID, a BASE, or a NEUTRAL SALT. The student writes a procedure and carries out certain tests. The table shows the results that were obtained.

Solution	Litmus paper	Electrical conductivity
1	No effect <i>not A or B</i>	Good <i>∴ S</i>
2	Turned blue <i>B</i>	Good <i>B</i>
3 <i>"BRA"</i>	Turned red <i>A</i>	Good <i>A</i>
4	No effect <i>not A or B</i>	None <i>not S</i> $\emptyset$
5	Turned blue <i>B</i>	Weak <i>WB</i>
6	Turned blue <i>B</i>	Good <i>Stronger B or</i>

Based on these results, which conclusion is the most appropriate?

- A) Solutions 2, 5 and 6 are bases, solution 3 is an acid and solutions 1 and 4 are salts ✓
- B) Solutions 2, 5 and 6 are bases, solution 3 is an acid and solutions 1 and 4 are distilled water
- C) Solutions 2, 5 and 6 are bases, solution 3 is an acid, solution 1 is a salt and solution 4 can not be classified
- D) Solution 3 is a base, solutions 2, 5 and 6 are acids and solutions 1 and 4 are salts

7. How does a solution conduct electricity?

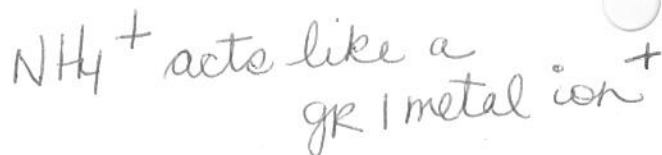
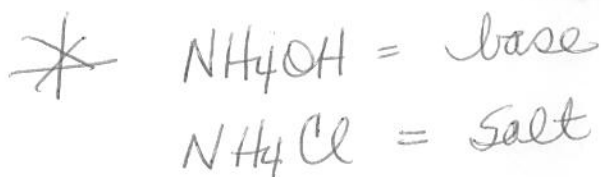
- ① the solid or gas or liq dissolves into water
- ② it then splits into mobile ions

8. Explain what a non-electrolyte is.

- a S, L or G that just dissolves into the water & just mixes with the water

9. If you are given a molecular formula, how can you determine if it is a non-electrolyte?

- H-NM or M-OH or M-NM = electrolyte
- otherwise it's not an electrolyte



alcohol

more concentrated

10. Which of the following is a non-electrolyte?

Mg(OH)<sub>2</sub>

B

B) H<sub>2</sub>SO<sub>4</sub>

A

C) P<sub>2</sub>S<sub>3</sub>

C

D) CaCl<sub>2</sub>

S

covalent cpd + not and not an ABS!

11. What am I?

a- I allow electric current to flow through water.

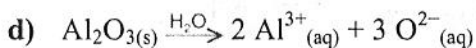
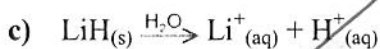
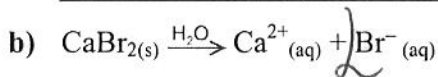
b- When dissolved in water, I do not allow electric current to flow through it.

c- My electrolytic dissociation provides ions other than H<sup>+</sup> and OH<sup>-</sup> ions.

d- I am an electrolyte that turns blue Litmus paper red.

electrolyte AB.  
non-elec.  
salt  
A

12. Are the following equations of electrolytic dissociation written correctly? Explain your answers.



13. Three light bulbs are put into three different solutions. Solution A causes the light bulb to be very bright, solution B's light bulb does not come on and solution C's light bulb produces a very dim light.

A- Which solution(s) is an (are) electrolytes? A & C

B- Which solution(s) is an (are) non-electrolytes? B

C- Which solution produces the strongest ionic dissolution? A

important!

14. What characteristic is common to acids, bases and salts that are in a solution?

ions + conduct electricity