

## NAMING ACIDS

Acids are substances which contain the element hydrogen.

Examine the following chart and answer the questions which follow it.

<u>Name of Acid</u>	<u>Formula</u>	
1. hydroiodic acid	$\text{HI}_{(\text{aq})}$	
2. hydrochloric acid	$\text{HCl}_{(\text{aq})}$	NOTE: "aq" means dissolved in water
3. hydrosulphuric acid	$\text{H}_2\text{S}_{(\text{aq})}$	
4. sulphuric acid	$\text{H}_2\text{SO}_{4(\text{aq})}$	
5. carbonic acid	$\text{H}_2\text{CO}_{3(\text{aq})}$	
6. chloric acid	$\text{HClO}_{3(\text{aq})}$	

- What do the names of the first three acids have in common?
- What do the formulae of the first three acids have in common?
- What do the names of the last three acids have in common?
- What do the formulae of the last three acids have in common?

### BINARY ACIDS:

The first three acids in the table are called binary acids. They are made from the corresponding gas dissolved in water. E.g. Hydrogen chloride gas dissolved in water gives hydrochloric acid. Binary acids contain two elements, one of which is hydrogen. Binary acids are named using the prefix HYDRO, meaning "water", and the suffix IC. All acids have the "ic" suffix ending.

Try naming the following:

$\text{HF}_{(\text{aq})}$  \_\_\_\_\_

$\text{H}_2\text{S}_{(\text{aq})}$  \_\_\_\_\_

Try writing formulas for the following:

hydrochloric acid \_\_\_\_\_

hydrobromic acid \_\_\_\_\_

### OXYACIDS:

The last three acids in the table are called oxyacids. They contain three elements, one of which is hydrogen and one of which is oxygen. Oxyacids are named using the suffix "ic".

Try naming the following:

$\text{HNO}_{3(\text{aq})}$  \_\_\_\_\_

$\text{H}_2\text{SO}_{4(\text{aq})}$  \_\_\_\_\_

$\text{H}_3\text{PO}_{4(\text{aq})}$  \_\_\_\_\_

Try writing the formula for the following:

carbonic acid \_\_\_\_\_

chloric acid \_\_\_\_\_

bromic acid \_\_\_\_\_

### DERIVATIVES OF OXYACIDS:

For each of the oxyacids, there are three closely related acids that differ only in the number of oxygen atoms present in the acid formula. The main oxyacid may be considered as the “parent” from which the others are derived.

$\text{HNO}_{3(\text{aq})}$ is nitric acid	- this is the main acid
$\text{HNO}_{2(\text{aq})}$ is nit <u>rous</u> acid	- subtract one oxygen from the main acid, change suffix to “ous”
$\text{HNO}_{(\text{aq})}$ is <u>hyponitrous</u> acid	- subtract two oxygens from the main acid, change prefix to “ic”, and suffix to “ous”
$\text{HNO}_{4(\text{aq})}$ is <u>per</u> nitric acid	- add one oxygen to the main acid, change prefix to “per”

Complete the table below. You must use your knowledge of polyatomic ions from earlier to help you determine the correct formula for the main acid.

Polyatomic ion	Subtract two oxygen from main acid	Subtract one oxygen from main acid	Main acid	Add one oxygen to the main acid
$\text{NO}_3^{1-}$	Hyponitrous acid $\text{HNO}_{(\text{aq})}$	Nitrous acid $\text{HNO}_{2(\text{aq})}$	Nitric acid $\text{HNO}_{3(\text{aq})}$	Pernitric acid $\text{HNO}_{4(\text{aq})}$
$\text{ClO}_3^{1-}$				
$\text{CO}_3^{1-}$				
$\text{SO}_4^{2-}$				
$\text{PO}_4^{3-}$				

Now try to write formulas for all of the acids below:

- a) hydroiodic acid \_\_\_\_\_  
b) perchloric acid \_\_\_\_\_

Now try to name all of the acids below:

- a)  $\text{HClO}_{2(\text{aq})}$  \_\_\_\_\_  
b)  $\text{HF}_{(\text{aq})}$  \_\_\_\_\_

c) nitric acid \_\_\_\_\_

c)  $\text{H}_3\text{PO}_{4(\text{aq})}$  \_\_\_\_\_

d) hyposulphurous acid \_\_\_\_\_

d)  $\text{H}_2\text{CO}_{4(\text{aq})}$  \_\_\_\_\_

e) hydrochloric acid \_\_\_\_\_

e)  $\text{H}_2\text{S}_{(\text{aq})}$  \_\_\_\_\_

### **NAMING BASES**

Most bases are substances which contain the elements hydrogen and oxygen, combined in the form of a hydroxide ion ( $\text{OH}^-$ ). Some bases may contain the bicarbonate, or hydrogen carbonate ion ( $\text{HCO}_3^-$ ). Some examples of bases are: sodium hydroxide ( $\text{NaOH}$ ), sodium hydrogen carbonate ( $\text{NaHCO}_3$ )

Try naming the following bases:

Write formulas for the following bases:

a)  $\text{NaOH}$  \_\_\_\_\_

a) lithium hydroxide \_\_\_\_\_

b)  $\text{KOH}$  \_\_\_\_\_

b) calcium hydroxide \_\_\_\_\_

c)  $\text{KHCO}_3$  \_\_\_\_\_

c) magnesium hydrogen carbonate \_\_\_\_\_

### **PUTTING IT ALL TOGETHER**

**Write the formula:**

**Write the name:**

Nitrous acid \_\_\_\_\_

$\text{H}_2\text{SO}_{4(\text{aq})}$  \_\_\_\_\_

Hydroiodic acid \_\_\_\_\_

$\text{H}_2\text{CO}_{2(\text{aq})}$  \_\_\_\_\_

Calcium hydroxide \_\_\_\_\_

$\text{NaOH}$  \_\_\_\_\_

Hypocarbonous acid \_\_\_\_\_

$\text{H}_2\text{S}_{(\text{aq})}$  \_\_\_\_\_

Perphosphoric acid \_\_\_\_\_

$\text{Mg}(\text{OH})_2$  \_\_\_\_\_

Chloric acid \_\_\_\_\_

$\text{HCl}_{(\text{aq})}$  \_\_\_\_\_

Sodium hydrogen carbonate \_\_\_\_\_

$\text{HNO}_{4(\text{aq})}$  \_\_\_\_\_

Hydrochloric acid \_\_\_\_\_

$\text{HF}_{(\text{aq})}$  \_\_\_\_\_

Nitric acid \_\_\_\_\_

$\text{KHCO}_3$  \_\_\_\_\_