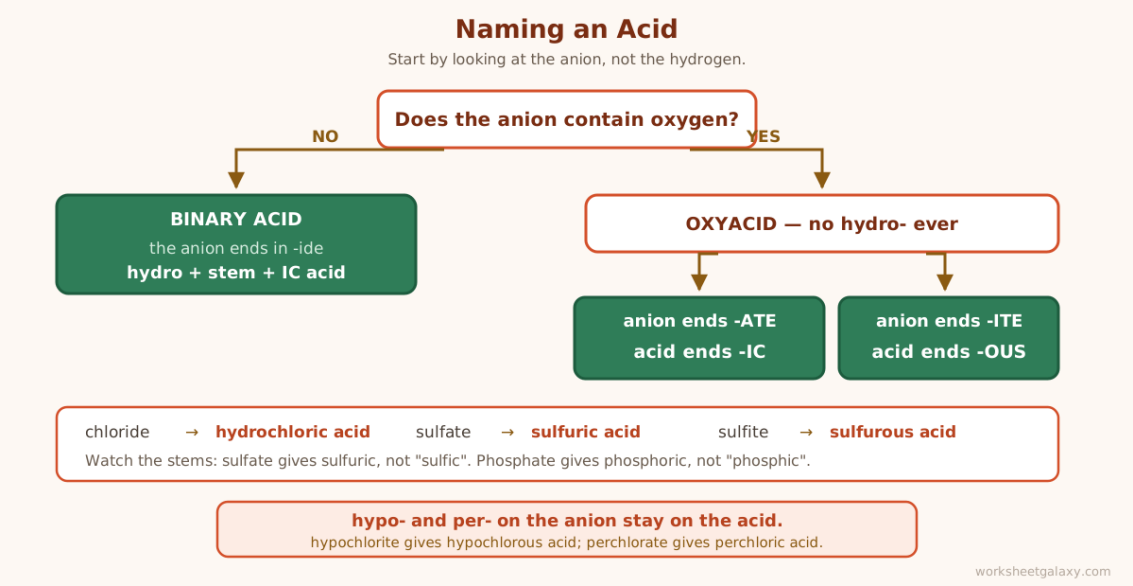
Naming Acids Worksheet

Grade 11 Chemistry · Binary acids, oxyacids, and the -ate / -ite endings

Name: _____ Date: _____ Score: / 24



Polyatomic ions used on this sheet

nitrate	NO_3^-	**nitrite**	NO_2^-	**sulfate**	SO_4^{2-}	**sulfite**	SO_3^{2-}
carbonate	CO_3^{2-}	**acetate**	$C_2H_3O_2^-$	**phosphate**	PO_4^{3-}	**phosphite**	PO_3^{3-}
chlorate	ClO_3^-	**chlorite**	ClO_2^-	**hypochlorite**	ClO^-	**perchlorate**	ClO_4^-

Part A · From the Anion

Each row names an anion. Write the name of the acid it forms.

#	Anion	Ending rule	Acid name
1	chloride	-ide	
2	sulfate	-ate	
3	nitrite	-ite	
4	carbonate	-ate	
5	phosphate	-ate	
6	hypochlorite	-ite	

Part B · Formula to Name

The anion is given to save you looking it up.

#	Acid	Anion present	Name
1	$HBr_{(aq)}$	bromide	

2	HNO_3	nitrate	
3	H_2SO_3	sulfite	
4	$HClO_4$	perchlorate	
5	$H_2S_{(aq)}$	sulfide	
6	$HC_2H_3O_2$	acetate	

Part C · Name to Formula

Use the ion table above. Remember enough hydrogen to balance the charge.

#	Acid name	Formula
1	hydrofluoric acid	
2	chloric acid	
3	phosphorous acid	
4	carbonic acid	
5	hydroiodic acid	

Part D · Spot the Error

Each name is wrong. Say which rule was broken, then write it correctly.

1. H_2SO_4 has been named **hydrosulfuric acid**.

   Correct name: _____

2. HNO_2 has been named **nitric acid**.

   Correct name: _____

3. $HCl_{(aq)}$ has been named **chloric acid**.

   Correct name: _____

4. H_3PO_4 has been named **phosphic acid**.

   Correct name: _____

Part E · Challenge The same four endings work for any series.

1. Chlorine forms four different oxyacids: $HClO$, $HClO_2$, $HClO_3$, $HClO_4$. Name all four, then explain how the name tracks the number of oxygen atoms.

Answer: _____

2. Explain why $HCl_{(aq)}$ is called hydrochloric acid but H_2SO_4 is never called hydrosulfuric acid.

Answer: _____

3. Bromine forms the same four oxyanions as chlorine: hypobromite, bromite, bromate and perbromate. Without being told the names, work out the acid name and formula for each.

Answer: _____

Answer Key · Naming Acids

Full worked solutions — Grade 11 Chemistry

Part A · From the Anion

1. chloride
   hydrochloric acid
2. sulfate
   sulfuric acid
3. nitrite
   nitrous acid
4. carbonate
   carbonic acid
5. phosphate
   phosphoric acid
6. hypochlorite
   hypochlorous acid

Part B · Formula to Name

1. $HBr_{(aq)}$ contains bromide
   hydrobromic acid
2. HNO_3 contains nitrate
   nitric acid
3. H_2SO_3 contains sulfite
   sulfurous acid
4. $HClO_4$ contains perchlorate
   perchloric acid
5. $H_2S_{(aq)}$ contains sulfide
   hydrosulfuric acid
6. $HC_2H_3O_2$ contains acetate
   acetic acid

Part C · Name to Formula

1. hydrofluoric acid
   $HF_{(aq)}$
2. chloric acid
   $HClO_3$
3. phosphorous acid
   H_3PO_3
4. carbonic acid
   H_2CO_3
5. hydroiodic acid
   $HI_{(aq)}$

Part D · Spot the Error

1. hydro- belongs only to acids whose anion contains no oxygen
   sulfuric acid
2. an anion ending in -ite gives an acid ending in -ous
   nitrous acid
3. a binary acid needs hydro-; chloric acid is a different compound, $HClO_3$
   hydrochloric acid

4. the stem is phosphor, not phosph
   phosphoric acid

Part E · Challenge

1. • HClO comes from hypochlorite, so it is hypochlorous acid
   • $HClO_2$ comes from chlorite, so it is chlorous acid
   • $HClO_3$ comes from chlorate, so it is chloric acid
   • $HClO_4$ comes from perchlorate, so it is perchloric acid
   • the number of oxygens rises across the series, and the name tracks it: hypo- for the fewest, then -ous, then -ic, then per- for the most
   hypochlorous acid, chlorous acid, chloric acid, perchloric acid

2. • hydro- marks an acid whose anion contains no oxygen at all, which is why it appears in hydrochloric acid
   • sulfate already contains oxygen, so H_2SO_4 is an oxyacid and takes no hydro-
   • using both would describe a compound that cannot exist: one with and without oxygen at the same time
   hydro- means no oxygen in the anion. Sulfate contains oxygen, so sulfuric acid never takes it.

3. • hypobromite → HBrO is hypobromous acid
   • bromite → $HBrO_2$ is bromous acid
   • bromate → $HBrO_3$ is bromic acid
   • perbromate → $HBrO_4$ is perbromic acid
   • the rules do not change with the element: the same four endings apply to any series of oxyanions
   hypobromous acid (HBrO), bromous acid ($HBrO_2$), bromic acid ($HBrO_3$), perbromic acid ($HBrO_4$)