

Naming Covalent Compounds & Acids

Quick reference

1	2	3	4	5
mono	di	tri	tetra	penta
6	7	8	9	10
hexa	hepta	octa	nona	deca

Molecular (two non-metals): use prefixes; never "mono" on the first element; second element ends in -ide. Drop the a/o before "oxide": monoxide, pentoxide.

Binary acids HX(aq): hydro + root + -ic acid (HCl(aq) → hydrochloric acid).

Oxyacids: -ate ion → -ic acid; -ite ion → -ous acid. NO₃⁻ nitrate, NO₂⁻ nitrite, SO₄²⁻ sulfate, SO₃²⁻ sulfite, CO₃²⁻ carbonate, PO₄³⁻ phosphate, ClO₃⁻ chlorate, ClO₂⁻ chlorite

A Molecular compounds: formula → name

6 marks

- | | | | |
|---------------------|-------|---------------------|-------|
| 1. CO | _____ | 2. CO ₂ | _____ |
| 3. N ₂ O | _____ | 4. PCl ₅ | _____ |
| 5. SF ₆ | _____ | 6. CCl ₄ | _____ |

B Molecular compounds: name → formula

6 marks

- | | | | |
|---------------------------|-------|---------------------------|-------|
| 7. nitrogen trifluoride | _____ | 8. dinitrogen pentoxide | _____ |
| 9. sulfur trioxide | _____ | 10. carbon disulfide | _____ |
| 11. diphosphorus trioxide | _____ | 12. silicon tetrachloride | _____ |

C Common names you should know

4 marks

- | | | | |
|----------------------|-------|-----------------------------------|-------|
| 13. H ₂ O | _____ | 14. NH ₃ | _____ |
| 15. CH ₄ | _____ | 16. H ₂ O ₂ | _____ |

D Binary acids

4 marks

- | | | | |
|-------------|-------|--------------------------|-------|
| 17. HCl(aq) | _____ | 18. HBr(aq) | _____ |
| 19. HF(aq) | _____ | 20. H ₂ S(aq) | _____ |

E Oxyacids

8 marks

Formula → name

21. $\text{HNO}_3(\text{aq})$ _____ 22. $\text{HNO}_2(\text{aq})$ _____
23. $\text{H}_2\text{SO}_4(\text{aq})$ _____ 24. $\text{H}_2\text{CO}_3(\text{aq})$ _____
25. $\text{H}_3\text{PO}_4(\text{aq})$ _____

Name → formula

26. sulfurous acid _____ 27. chloric acid _____
28. chlorous acid _____

F Ionic or molecular? Name it

4 marks

Decide which naming system applies, then write the name.

29. CaCl_2 _____
30. PCl_3 _____
31. FeO _____
32. SO_2 _____

G Spot the mistake

3 marks

33. A student names CO as "monocarbon monoxide."

34. A student names NaCl as "sodium monochloride."

35. A student names $\text{HNO}_3(\text{aq})$ as "hydronitric acid."

H Challenge

2 marks

36. Perchlorate is ClO_4^- . Name the acid $\text{HClO}_4(\text{aq})$.

37. Hypochlorite is ClO^- . Name the acid $\text{HClO}(\text{aq})$.

Naming Covalent Compounds & Acids

Name: _____

Date: _____ Score: ____ / 37

ANSWER KEY

Quick reference

1	2	3	4	5
mono	di	tri	tetra	penta
6	7	8	9	10
hexa	hepta	octa	nona	deca

Molecular (two non-metals): use prefixes; never "mono" on the first element; second element ends in -ide. Drop the a/o before "oxide": monoxide, pentoxide.

Binary acids HX(aq): hydro + root + -ic acid (HCl(aq) → hydrochloric acid).

Oxyacids: -ate ion → -ic acid; -ite ion → -ous acid. NO_3^- nitrate, NO_2^- nitrite, SO_4^{2-} sulfate, SO_3^{2-} sulfite, CO_3^{2-} carbonate, PO_4^{3-} phosphate, ClO_3^- chlorate, ClO_2^- chlorite

A Molecular compounds: formula → name

6 marks

- | | | | |
|---------------------|---------------------|---------------------|--------------------------|
| 1. CO | carbon monoxide | 2. CO ₂ | carbon dioxide |
| 3. N ₂ O | dinitrogen monoxide | 4. PCl ₅ | phosphorus pentachloride |
| 5. SF ₆ | sulfur hexafluoride | 6. CCl ₄ | carbon tetrachloride |

B Molecular compounds: name → formula

6 marks

- | | | | |
|---------------------------|-------------------------------|---------------------------|-------------------------------|
| 7. nitrogen trifluoride | NF ₃ | 8. dinitrogen pentoxide | N ₂ O ₅ |
| 9. sulfur trioxide | SO ₃ | 10. carbon disulfide | CS ₂ |
| 11. diphosphorus trioxide | P ₂ O ₃ | 12. silicon tetrachloride | SiCl ₄ |

C Common names you should know

4 marks

- | | | | |
|----------------------|---------|-----------------------------------|-------------------|
| 13. H ₂ O | water | 14. NH ₃ | ammonia |
| 15. CH ₄ | methane | 16. H ₂ O ₂ | hydrogen peroxide |

D Binary acids

4 marks

- | | | | |
|-------------|-------------------|--------------------------|--------------------|
| 17. HCl(aq) | hydrochloric acid | 18. HBr(aq) | hydrobromic acid |
| 19. HF(aq) | hydrofluoric acid | 20. H ₂ S(aq) | hydrosulfuric acid |

E Oxyacids

8 marks

Formula → name

21. $\text{HNO}_3(\text{aq})$ **nitric acid**

22. $\text{HNO}_2(\text{aq})$ **nitrous acid**

23. $\text{H}_2\text{SO}_4(\text{aq})$ **sulfuric acid**

24. $\text{H}_2\text{CO}_3(\text{aq})$ **carbonic acid**

25. $\text{H}_3\text{PO}_4(\text{aq})$ **phosphoric acid**

Name → formula

26. sulfurous acid

$\text{H}_2\text{SO}_3(\text{aq})$

27. chloric acid

$\text{HClO}_3(\text{aq})$

28. chlorous acid

$\text{HClO}_2(\text{aq})$

F Ionic or molecular? Name it

4 marks

Decide which naming system applies, then write the name.

29. CaCl_2 **Ionic: calcium chloride**

30. PCl_3 **Molecular: phosphorus trichloride**

31. FeO **Ionic: iron(II) oxide**

32. SO_2 **Molecular: sulfur dioxide**

G Spot the mistake

3 marks

33. A student names CO as "monocarbon monoxide."

"Mono" is never used on the first element. Correct: carbon monoxide

34. A student names NaCl as "sodium monochloride."

NaCl is ionic, and prefixes are only for molecular compounds. Correct: sodium chloride

35. A student names $\text{HNO}_3(\text{aq})$ as "hydronitric acid."

"Hydro-" is only for binary acids. Nitrate (-ate) becomes -ic. Correct: nitric acid

H Challenge

2 marks

36. Perchlorate is ClO_4^- . Name the acid $\text{HClO}_4(\text{aq})$.

perchloric acid

37. Hypochlorite is ClO^- . Name the acid $\text{HClO}(\text{aq})$.

hypochlorous acid