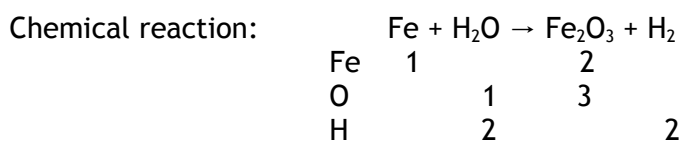
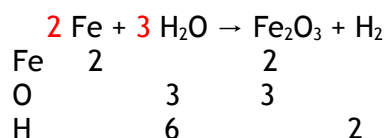


Exercises about balancing chemical equations

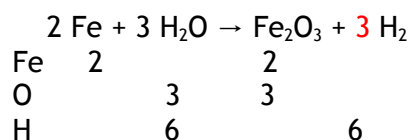
1) Metallic iron reacts with water to produce diiron trioxide and hydrogen gas (H₂)



Iron and oxygen aren't balanced:

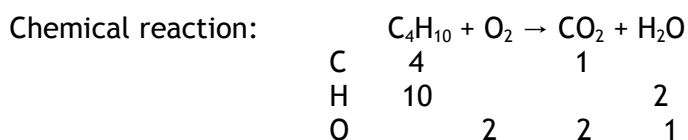


Hydrogen is not balanced:

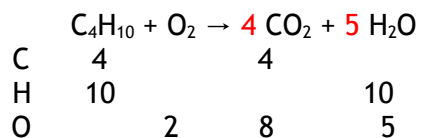


Balanced equation: $2 \text{Fe} + 3 \text{H}_2\text{O} \rightarrow \text{Fe}_2\text{O}_3 + 3 \text{H}_2$

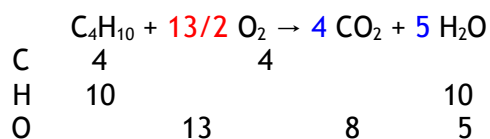
2) Butane (C₄H₁₀) reacts with oxygen (O₂) to produce carbon dioxide and water.



Carbon, hydrogen and oxygen aren't balanced. We balance carbon and hydrogen first:

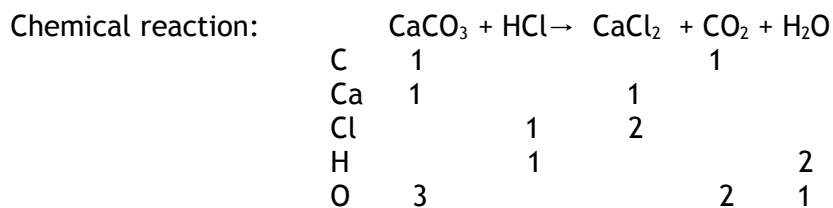


Oxygen is not balanced:

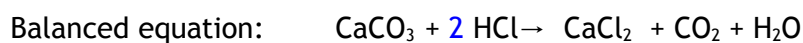
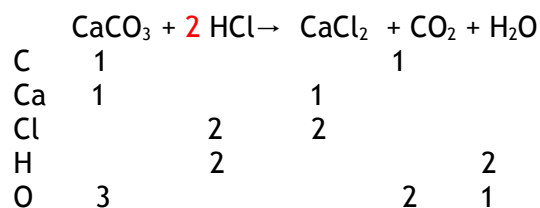


Balanced equation: $\text{C}_4\text{H}_{10} + 13/2 \text{O}_2 \rightarrow 4 \text{CO}_2 + 5 \text{H}_2\text{O}$

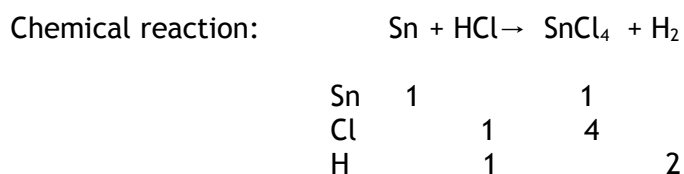
- 3) Marble (CaCO_3) reacts with hydrogen chloride to produce calcium dichloride, carbon dioxide and water.



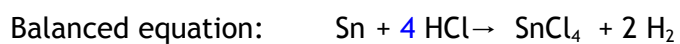
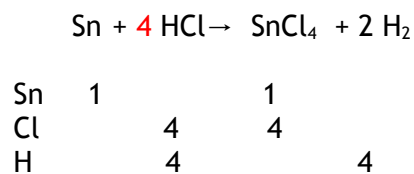
Chloride and hydrogen aren't balanced:



- 4) Metallic tin reacts with hydrogen chloride to produce tin tetrachloride and hydrogen gas (H_2)



Chloride and hydrogen aren't balanced:

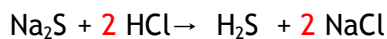


- 5) Disodium sulphide reacts with hydrogen chloride to produce dihydrogen sulphide (*) and sodium chloride.

Chemical reaction: $\text{Na}_2\text{S} + \text{HCl} \rightarrow \text{H}_2\text{S} + \text{NaCl}$

Na	2			1
S	1		1	
Cl		1		1
H		1	2	

Sodium and hydrogen aren't balanced:



Na	2			2
S	1		1	
Cl		2		2
H		2	2	

Balanced equation: $\text{Na}_2\text{S} + 2 \text{HCl} \rightarrow \text{H}_2\text{S} + 2 \text{NaCl}$

- 6) Glucose ($\text{C}_6\text{H}_{12}\text{O}_6$) reacts with oxygen (O_2) to produce carbon dioxide and water.

Chemical reaction: $\text{C}_6\text{H}_{12}\text{O}_6 + \text{O}_2 \rightarrow \text{CO}_2 + \text{H}_2\text{O}$

C	6			1
H	12			2
O	6	2	2	1

Carbon, hydrogen and oxygen aren't balanced. We balance carbon and hydrogen first:

	$\text{C}_6\text{H}_{12}\text{O}_6 + \text{O}_2 \rightarrow 6 \text{CO}_2 + 6 \text{H}_2\text{O}$			
C	6		6	
H	12			12
O	6	2	12	6

Oxygen is not balanced:

	$\text{C}_6\text{H}_{12}\text{O}_6 + 6 \text{O}_2 \rightarrow 6 \text{CO}_2 + 6 \text{H}_2\text{O}$			
C	6		6	
H	12			12
O	6	12	12	6

Balanced equation: $\text{C}_6\text{H}_{12}\text{O}_6 + 6 \text{O}_2 \rightarrow 6 \text{CO}_2 + 6 \text{H}_2\text{O}$

7) Iron trihydroxide reacts with hydrogen bromide to produce iron tribromide and water.

Chemical reaction: $\text{Fe(OH)}_3 + \text{HBr} \rightarrow \text{FeBr}_3 + \text{H}_2\text{O}$

Fe	1		1	
Br		1	3	
O	3			1
H	3	1		2

Bromine, Oxygen and Hydrogen aren't balanced:

$\text{Fe(OH)}_3 + 3 \text{HBr} \rightarrow \text{FeBr}_3 + 3 \text{H}_2\text{O}$

Fe	1		1	
Br		3	3	
O	3			3
H	3	3		6

Balanced equation: $\text{Fe(OH)}_3 + 3 \text{HBr} \rightarrow \text{FeBr}_3 + 3 \text{H}_2\text{O}$

8) Cobalt trihydroxide reacts with dihydrogen sulphide to produce dicobalt trisulphide and water

Chemical reaction: $\text{Co(OH)}_3 + \text{H}_2\text{S} \rightarrow \text{Co}_2\text{S}_3 + \text{H}_2\text{O}$

Co	1		2	
S		1	3	
O	3			1
H	3	2		2

Cobalt, Sulfur, Oxygen and Hydrogen aren't balanced. We balance Cobalt and Sulfur first:

$2 \text{Co(OH)}_3 + 3 \text{H}_2\text{S} \rightarrow \text{Co}_2\text{S}_3 + \text{H}_2\text{O}$

Co	2		2	
S		3	3	
O	6			1
H	6	6		2

Oxygen and Hydrogen aren't balanced:

$2 \text{Co(OH)}_3 + 3 \text{H}_2\text{S} \rightarrow \text{Co}_2\text{S}_3 + 6 \text{H}_2\text{O}$

Co	2		2	
S		3	3	
O	6			6
H	6	6		12

Balanced equation: $2 \text{Co(OH)}_3 + 3 \text{H}_2\text{S} \rightarrow \text{Co}_2\text{S}_3 + 6 \text{H}_2\text{O}$