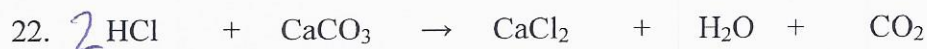
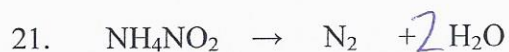
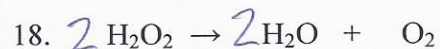
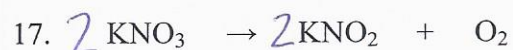
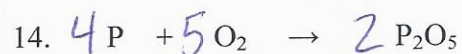
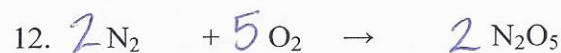
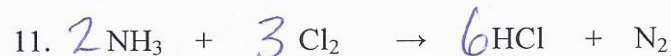
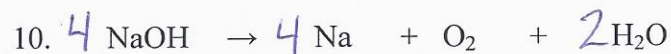
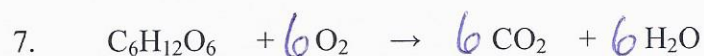
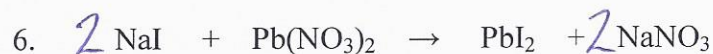
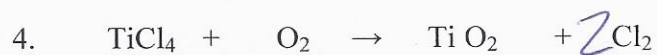
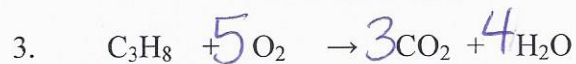
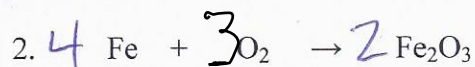
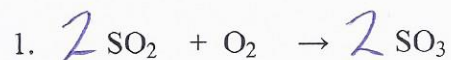
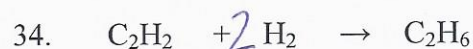
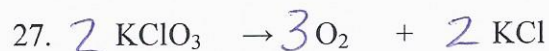
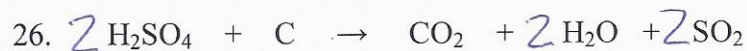
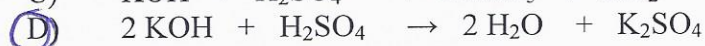
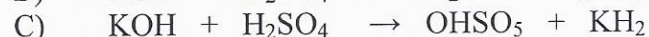


Balance the equations





41. Choose the balanced equation



42. Choose the balanced equation

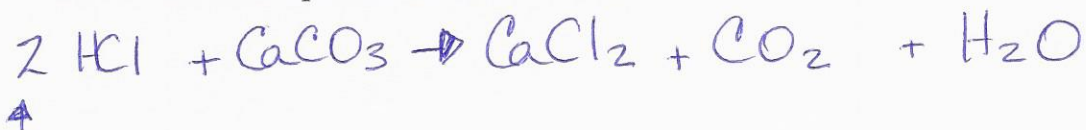
- A) $2 \text{HCl} + \text{NaOH} \rightarrow \text{NaCl} + \text{H}_2\text{O}$
B) $\text{HCl} + \text{NaOH} \rightarrow \text{NaCl} + 2 \text{H}_2\text{O}$
C) $\text{HCl} + \text{NaOH} \rightarrow \text{NaCl} + \text{H}_2\text{O}$
D) $\text{HCl} + 2 \text{NaOH} \rightarrow 2 \text{NaCl} + 2 \text{H}_2\text{O}$

43. Which equation is **not** balanced?

- A) $2 \text{NO} + \text{O}_2 \rightarrow 2 \text{NO}_2$
B) $2 \text{Na} + 2 \text{H}_2\text{O} \rightarrow 2 \text{NaOH} + \text{H}_2$
C) $\text{H}_3\text{PO}_4 + 3 \text{KOH} \rightarrow \text{K}_3\text{PO}_4 + 3 \text{H}_2\text{O}$
D) $3 \text{HBr} + \text{Fe}(\text{OH})_3 \rightarrow \text{FeBr}_3 + 6 \text{H}_2\text{O}$

44. The neutralization of hydrochloric acid (HCl) by calcium carbonate (CaCO_3) produces calcium chloride (CaCl_2), carbon dioxide (CO_2) and water (H_2O).

Write the balanced equation for this neutralization reaction.



45. The combustion of methane, CH_4 mixed with O_2 produces carbon dioxide, CO_2 , and water, H_2O . The unbalanced chemical equation for this reaction is as follows:



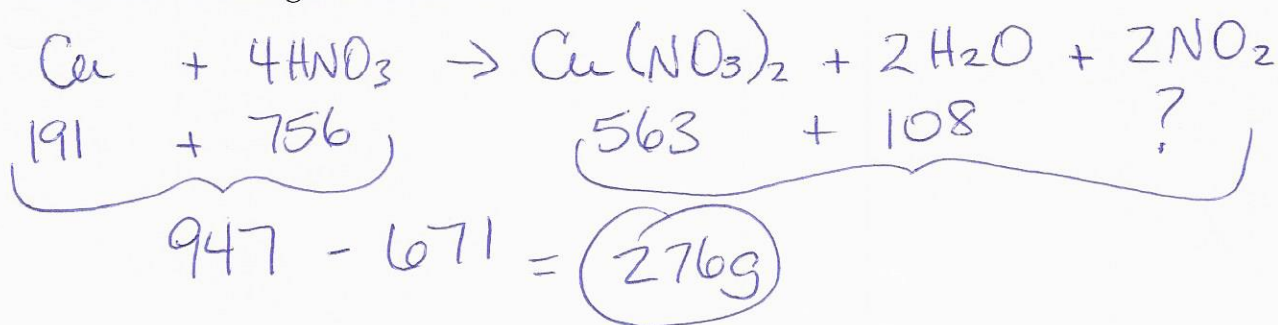
Balance the chemical equation for this combustion reaction.



46. When 191 g of copper, Cu, is combined with 756 g of nitric acid, HNO_3 , the chemical reaction produces 563 g of copper nitrate, $\text{Cu}(\text{NO}_3)_2$, 108 g of water, H_2O , and a certain amount of nitrogen dioxide, NO_2 . This reaction is represented by the following balanced chemical equation:



What mass of nitrogen dioxide does this reaction produce?



47. The combustion of 16 g of methane (CH₄) in 64 g of oxygen gas (O₂) produces 36 g of water (H₂O) and a certain mass of carbon dioxide (CO₂). The following balanced equation represents this combustion reaction:

Combustion Reaction Involving Methane



$$16 + 64 = 36 + ?$$

$$80 - 36 = 44\text{g}$$

The combustion of 11 g of propane (C₃H₈) in 40 g of oxygen gas (O₂) produces 18 g of water (H₂O) and a certain mass of carbon dioxide (CO₂). The following balanced equation represents this combustion reaction:

Combustion Reaction Involving Propane





$$11 + 40 = 18 + ?$$













$$51 - 18 = 33\text{g}$$

Which of these two reactions produces the smaller mass of carbon dioxide (CO₂)? For each reaction, show the calculations required to determine the mass of carbon dioxide (CO₂) produced.

Second reaction produces less CO₂.

48. Carbon burns in the presence of oxygen, O₂, to form carbon dioxide, CO₂.

The carbon atom is represented by  and the oxygen atom by . Which model represents this chemical reaction?

- A)  +  →  + Energy
- B)  +  →  + Energy
- C)  +  →  + Energy
- D)  +  →  + Energy