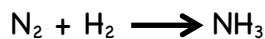


Balancing Equations

1. Why is the following equation not balanced?



This equation is not balanced because the number of hydrogen and nitrogen atoms found in the reactants do not balance the ones found in the products.

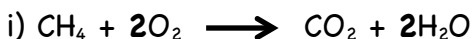
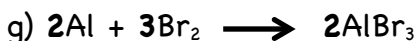
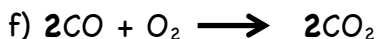
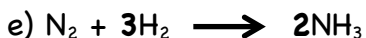
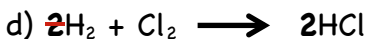
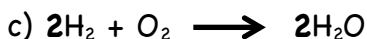
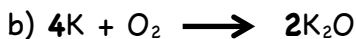
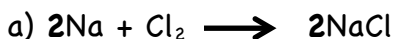
There are 2 nitrogen atoms in the N_2 but only 1 nitrogen in the NH_3 .
There are 2 hydrogen atoms in the H_2 but three hydrogens in the NH_3 .

2. The following is an attempt to balance the above equation. What is wrong with the way the equation is balanced?



The subscripts have been changed. This changes the compounds. You must change coefficients to balance.

3. Balance the following equations.



4. For each of the following, write the correct skeleton equation, and then balance it to form a chemical equation.

a) copper (II) oxide + hydrogen \longrightarrow copper + water

Skeleton



Balanced



b) lead (II) nitrate + potassium iodide \longrightarrow lead (II) iodide + potassium nitrate

Skeleton



Balanced



c) calcium + water \longrightarrow calcium hydroxide + hydrogen gas

Skeleton



Balanced



d) lead (II) sulfide + oxygen \longrightarrow lead + sulfur dioxide

Skeleton

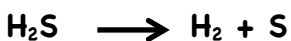


Balanced



e) hydrogen sulfide \longrightarrow hydrogen + sulfur

Skeleton



Balanced



Or

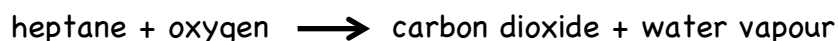
Skeleton



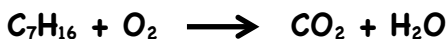
Balanced



4. Imagine that you are an engineer trying to determine how much air had to be supplied to burn gasoline in a car engine. Assuming that the gasoline is heptane (C_7H_{16}), the word equation is



a) Write the skeleton equation for the reaction.



b) Balance the equation by adding coefficients as necessary.



c) How many molecules of oxygen are required for every molecule of heptane that burns?

11 molecules

5. Nitrogen oxides are a group of air pollutants produced by internal combustion engines in automobiles. These pollutants are formed by the reaction of atmospheric nitrogen (N_2) and oxygen (O_2) to form various combinations including NO , NO_2 , N_2O_4 , N_2O_3 , and N_2O_5 . Write balanced chemical equations to represent the production of each of these substances.

