

ChemQuest 28

Chemical Reactions!

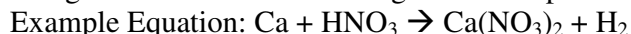
Name: _____

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Information: Introduction to Reactions

During a chemical reaction, new substances are formed. Reactants are transformed into different products. Atoms are never created or destroyed, but they are rearranged. A chemical equation represents what happens during a reaction. The following is an example of a chemical equation:



This equation describes the reaction of calcium (Ca) with nitric acid (HNO₃) to produce calcium nitrate (Ca(NO₃)₂) and hydrogen gas (H₂). You may notice that there are more total atoms on the right side than there are on the left side of the equation. If this seems strange to you, don't worry about it now; we'll fix this later.

Note in the above equation that hydrogen gas is written as H₂ and not simply as H. There are a few elements that exist as diatomic molecules. If a substance is diatomic then the substance must always be bonded to something. A hydrogen atom is diatomic and so it must be bonded to something else like in HCl or HNO₃. If nothing is available for it to bond to, it will bond to itself by forming H₂. All of the diatomic substances are listed below:

Br I N Cl H O F

When by themselves these elements exist as Br₂, I₂, N₂, Cl₂, H₂, O₂, and F₂. By the way, you can remember these by recalling a made-up name: Mr. Brinclhof.

Critical Thinking Questions

1. Consider the bromine atoms in this reaction: $\text{LiBr} + \text{P} \rightarrow \text{Li}_3\text{P} + \text{Br}_2$.

a) Why is bromine written as Br₂ on the right side?

Bromine is a diatomic molecule and always needs to be bonded to something; even bonding to itself works.

b) Why is it not necessary for LiBr to be written as LiBr₂?

The Br is already bonded to something else (the Li). If it were written LiBr₂ it would not be a neutral compound.

2. What are the reactants in the example equation in the above information section?

Reactants are written on the left side of the equation and so the reactants are Ca and HNO₃.