

Types of Chemical Reactions

Unit: Chemical Reactions

NGSS Standards/MA Curriculum Frameworks (2016): HS-PS1-7

Mastery Objective(s): (Students will be able to...)

- Recognize & identify the five major classes of chemical reactions.

Success Criteria:

- Reactions are correctly identified.

Tier 2 Vocabulary: reaction

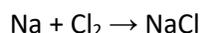
Language Objectives:

- Explain what happens in each of the types of reaction.

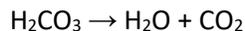
Notes:

There are many types of chemical reactions. Five of the most common are:

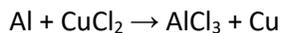
synthesis: two or more reactants combine to form a single product. For example:



decomposition: one reactant disintegrates (decomposes) to form two or more products:



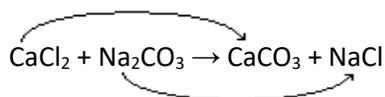
single replacement (sometimes called single displacement): atoms of one element replace atoms of another in a compound:



Most of the single replacement reactions you will encounter involve metals reacting with ionic compounds. In this type of single replacement reaction, a positive ion (usually a metal) replaces the other positive ion, or a negative ion (often a non-metal) replaces the other negative ion.

Use this space for summary and/or additional notes:

double replacement (sometimes called a double displacement or metathesis reaction): when two positive ions (or two negative ions) switch with each other to form two new compounds. For example:



Ca starts out paired with Cl, and Na is paired with CO₃. In the reaction, Ca and Na trade places so that Ca is now with CO₃ and Na is now with Cl. (Or you could think of it as Cl and CO₃ trading places—the result is the same.)

combustion: a special kind of reaction in which a hydrocarbon (a compound containing only carbon and hydrogen) reacts with O₂ (burns, or “combusts”) to form CO₂ and H₂O. For example:



All flames are chemical reactions. (The flame itself is the light—photons of energy—produced by the reaction.) Most flames are produced by combustion reactions involving hydrocarbons and oxygen.

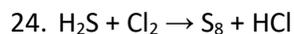
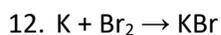
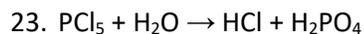
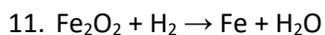
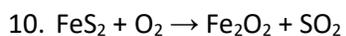
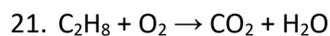
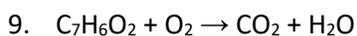
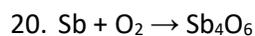
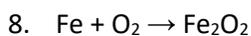
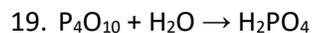
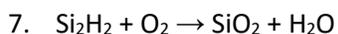
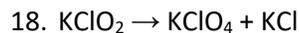
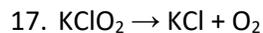
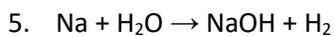
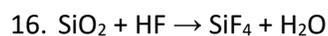
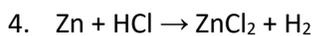
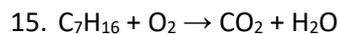
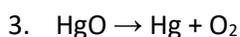
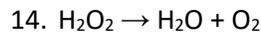
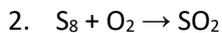
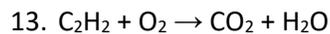
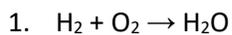
The internal combustion engine in your car is a special chemical reactor, in which octane (C₈H₁₈) and other hydrocarbons combust in a chamber (cylinder), producing heat. The heat makes the gases inside the cylinder expand. The expanding gases push the piston, which makes the car go.

Use this space for summary and/or additional notes:

Homework Problems

For each of the following chemical reactions, indicate whether the type of reaction is:

- synthesis
- single replacement
- combustion
- decomposition
- double replacement
- none of the above



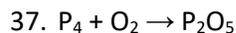
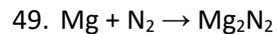
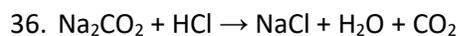
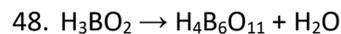
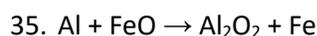
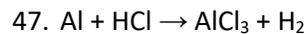
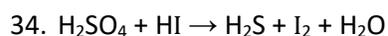
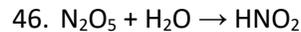
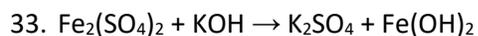
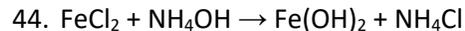
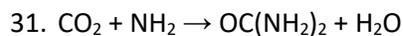
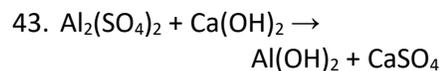
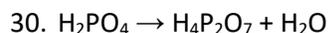
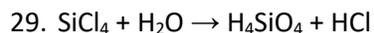
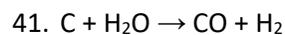
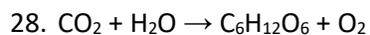
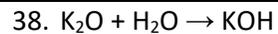
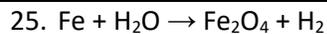
Use this space for summary and/or additional notes:

Types of Chemical Reactions

Big Ideas

Details

Unit: Chemical Reactions



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