

TYPES OF CHEMICAL REACTIONS



INDICATORS OF A REACTION

- Emission of heat
- Giving off light
- Formation of a precipitate
- Formation of a gas
- Color change



TYPES OF CHEMICAL REACTIONS

- There are 5 basic reaction types:
 - Synthesis or Combination
 - Decomposition
 - Single Replacement
 - Double Replacement
 - Combustion



SYNTHESIS REACTIONS

- Occurs when two substances (generally 2 different elements) combine and form a single new compound
 - General Formula:



Kind of like a celebrity marriage...





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= **Kimye**

Kanye West

Kim Kardashian



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= **Bennifer**

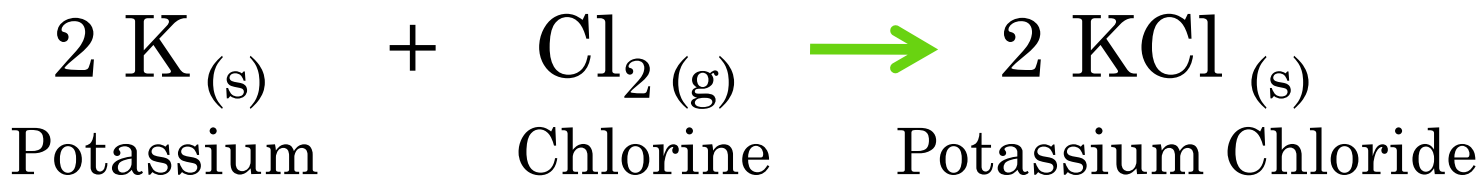
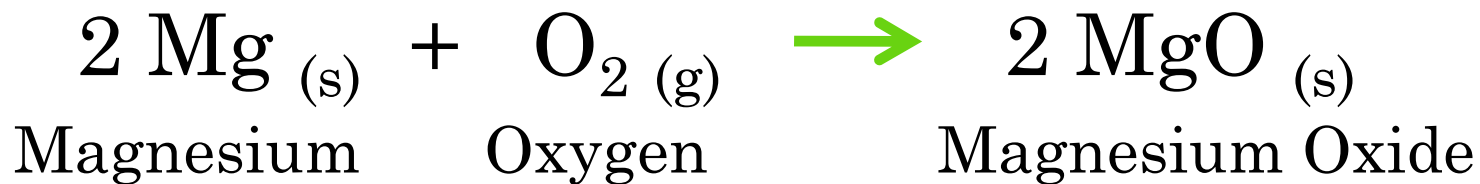
Ben Affleck

Jennifer Garner



○ Formation of a precipitate is an indication that a synthesis reaction has taken place

● Example:



DECOMPOSITION REACTIONS

- A single compound breaks down into two or more simpler products or elements.
 - General Formula

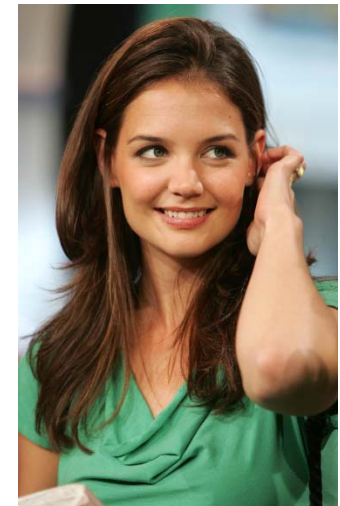


Kind of like a celebrity divorce/breakup... 

Tomkat =



+



Tom Cruise

Katie Holmes

Ashmi =



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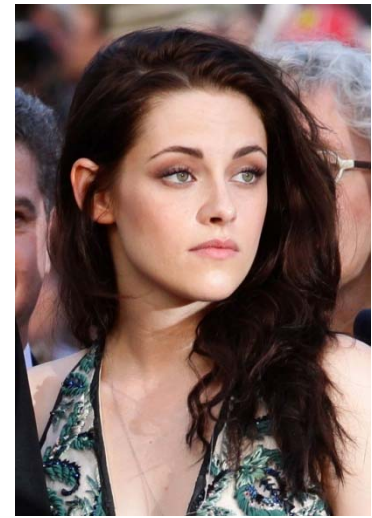
Ashton Kutcher

Demi Moore

Robsten =



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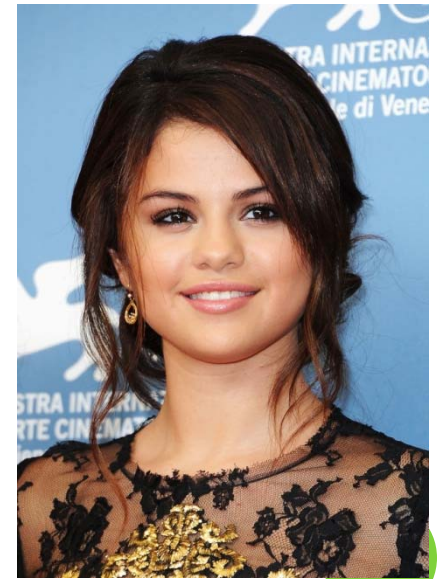


Rob Pattinson Kristen Stewart

Jelena =



+



Justin Bieber Selena Gomez

- Usually **require energy** in the form of heat, light, or electricity in order to occur
 - Example:



Decomposition is the **OPPOSITE** reaction of Synthesis!



SINGLE-REPLACEMENT REACTION

- Occurs when one element replaces another in a compound.
 - General Formula:



In Hollywood, this usually takes place when you star in a movie with an *extremely* good looking costar...





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Brad & Jen

+

Angelina Jolie



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Brangelina

+

Jennifer Aniston



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Katy & Russ + John Mayer



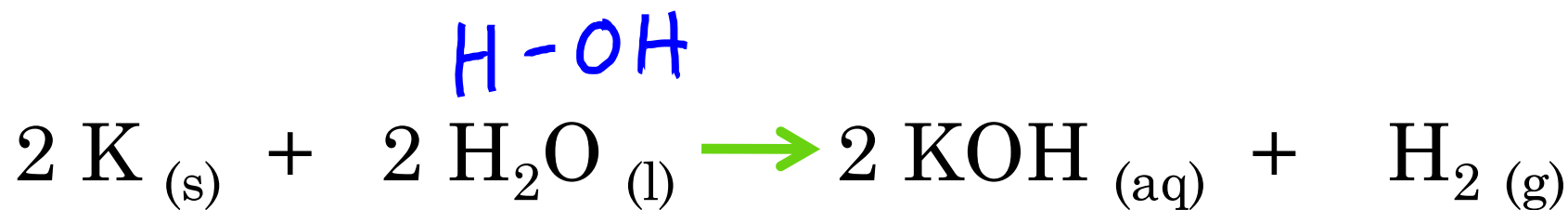
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Katy & John + Russell Brand

- Generally occur when a ionic compound comes in contact with a more reactive metal or more reactive halogen.

- Example: (man) (girl)



DOUBLE-REPLACEMENT REACTION

- Parts of two compounds switch places to form two new compounds
 - General Formula



Think Hollywood spouse swap...





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**Justin Timberlake &
Cameron Diaz**

**Gerard Butler &
Jessica Biel**



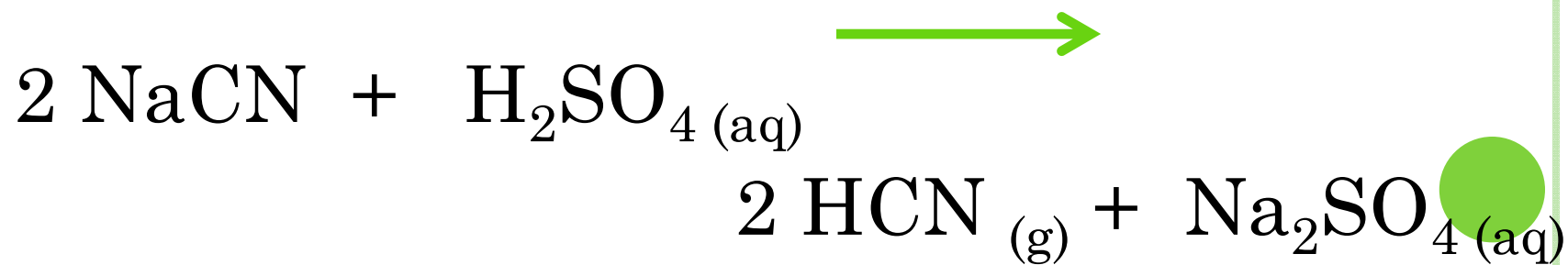
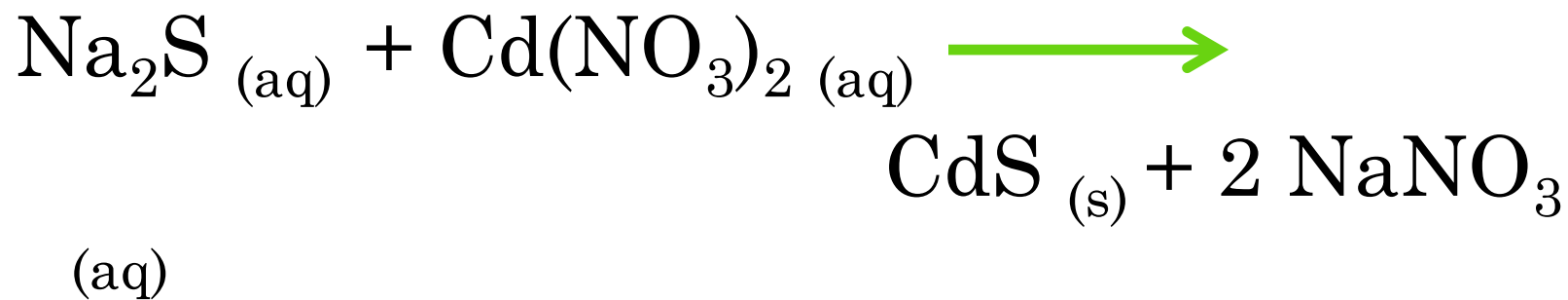
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**Justin Timberlake &
Jessica Biel**

**+ Gerard Butler &
Cameron Diaz**

- Generally take place in aqueous solution
- Often produce a precipitate, gas, or molecular compound (H₂O)
 - Example:

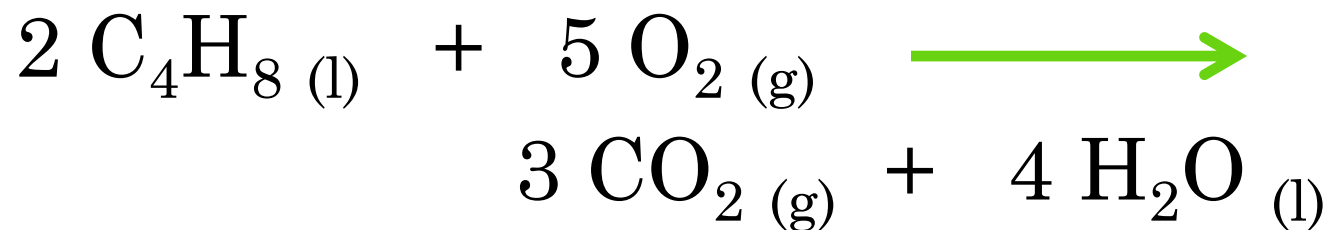


COMBUSTION REACTIONS

- An element or compound reacts with oxygen gas (O_2)
- Often produces energy in the form of heat and light



- Combustion of a hydrocarbon chain produces water and carbon dioxide
 - Example:



MAIN CONCEPTS

○ **Synthesis**

- TWO (or more) reactants combine to form ONE product

○ **Decomposition**

- ONE reactant yields TWO (or more) products

○ **Single-Replacement**

- ONE element and ONE compound form ONE different element and ONE new compound.

○ **Double-Replacement**

- TWO reactants yield TWO new products

○ **Combustion**

- Reaction with oxygen gas and ALWAYS forms water and carbon dioxide