

Key

Chapter 14 Review

1. Why do we use an equation for a chemical reaction that correctly preserves the number and type of atoms on both sides of the reaction?

To comply with the law of conservation of mass - mass is neither created or destroyed in a chemical reaction

2. What is the number in an equation that designates the number of molecules of a substance taking part in a chemical reaction called?



3. What is the substance formed in a chemical reaction called?

product(s)

4. What are the starting substances in a chemical reaction called?

reactant(s)

5. What is the solid product that comes out of solution in a chemical reaction called?

precipitate

6. Define the following terms:

a. (aq), (s), (l), (g)

aqueous (in solution), solid, liquid, gas

b. activation energy

Energy required for a reaction to occur

c. coefficient (in a chemical equation)

in front of a substance in a chemical equation that represents the # of particles of the substance.

d. subscript (in a chemical formula)

lower # after an element which designates how many of that atom.

e. precipitate

Solid substance that comes out of solution

f. endothermic/exothermic

Endo: energy absorbed

exo: energy released

g. alpha radiation

Emission of Alpha particles (${}^4_2\text{He}$) α
 $2p^+ \text{ \& } 2n$

h. beta radiation

Emission of Beta particles (e^-) β
(neutron breaks into $p^+ \text{ \& } e^-$ and e^- is emitted)

i. gamma radiation

High energy electromagnetic radiation γ

j. half-life

Amount of time required for $1/2$ of a radioisotope to decay

k. fusion/fission

Fusion: combining of nuclei

Fission - splitting of nuclei

7. How many kilo, deci, centi, and milli grams are in 1 gram?

$$1 \text{ Kg} = 1000 \text{ g}$$

$$1000 \text{ mg} = 1 \text{ g}$$

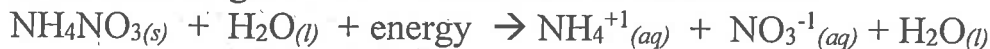
$$10 \text{ dg} = 1 \text{ g}$$

$$100 \text{ cg} = 1 \text{ g}$$

8. Write the balanced equation for the following reaction: The fuel used in gas grills is called propane (C_3H_8). Propane reacts with oxygen gas (O_2) found in the air to produce carbon dioxide (CO_2) and water vapor (H_2O).



9. Is the following reaction endothermic or exothermic?



Endothermic

10. Name three examples of radiation that you might encounter in your environment?

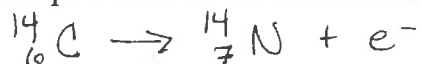
cell phones, air travel, xrays, basements, space
brick/stone buildings, bananas, Brazil nuts

11. What radioactive technique is used to determine the age of fossils?

Carbon-Dating

12. Carbon-14 undergoes beta decay to become another element.

a. What is the product of the radioactive decay?



b. What is the new element?

Nitrogen-14

13. Complete the table below for the indicated radioactive decay reactions.

Type of decay	Proton change	Neutron change	Atomic # change	Mass # change
Alpha decay	-2	-2	-2	-4
Beta decay	+1	-1	+1	0
Gamma decay	0	0	0	0

14. What does the Law of Conservation of Mass state?

Mass cannot be created or destroyed in a chemical reaction or physical change.

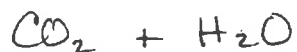
15. In the chemical equation below:



a. What are the reactants?



b. What are the products?



c. What does the arrow mean?

"to form" or "yields"

16. Describe the five types of reactions.

- Synthesis: $A + B \rightarrow AB$ Two or more substances combine to form one product
- Decomposition: $AB \rightarrow A + B$ One compound breaks down into 2 or more substances
- Single Displacement: $A + BX \rightarrow AX + B$
An element replaces a similar element in a compound.
- Double Displacement: $AB + CD \rightarrow AD + CB$
Ions exchange places. Produces either a precipitate, a gas, or water.
- Combustion: substances combines with oxygen to produce energy
synthesis with O_2 or Carbon compound + $O_2 \rightarrow CO_2 + H_2O$

17. Balance the following equations and indicate what type of reaction it is.



Synthesis



Synthesis



single



single