

## Unit 8 Review - Chemical and Nuclear Reactions

LT1: I can identify parts of a chemical reaction

1. What is the difference between a reactant and a product?

Reactants - left side, starting substances

Products - right side, created by the reaction

2. What are the 4 states of matter and how are they represented in a chemical equation?

Solid - (s)

liquid - (l)

gas - (g)

aqueous (dissolved in water) - (aq)

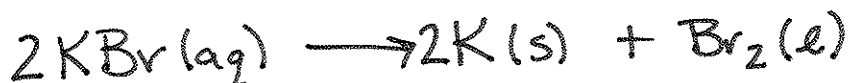
LT2: I can write a chemical equation from a word problem

From the word equation write a chemical equation using the correct compound formulas. BE SURE TO INCLUDE STATE SYMBOLS. Balance the chemical equation.

3. Aqueous potassium chloride is mixed with aqueous silver nitrate to produce aqueous potassium nitrate and solid silver chloride



4. A solution of aqueous potassium bromide breaks down into potassium metal and elemental bromine.



5. Iron metal is placed into a solution of copper (II) sulfate. The result is a solution of iron (II) sulfate and copper metal.



6. Sodium metal reacts with water vapor in air to form solid sodium hydroxide and hydrogen gas.



7. Sulfur trioxide in the air reacts with water vapor to form aqueous hydrogen sulfate.



LT3: I can identify/classify types of equations

LT4: I can predict products for simple equations

LT5: I can balance a chemical equation

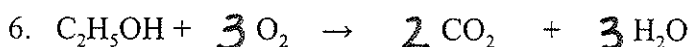
4. What is the law of conservation of matter?

matter cannot be created or destroyed

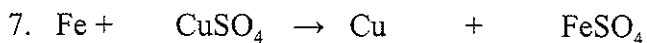
Balance and classify the equations using the correct coefficients.



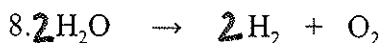
Double Replacement



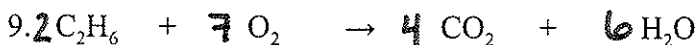
Combustion



Single Replacement

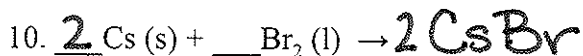


Decomposition

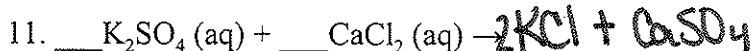


Combustion

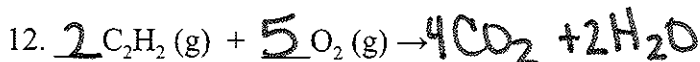
Classify, predict the products, and balance the following reactions. You do NOT need to include state symbols.



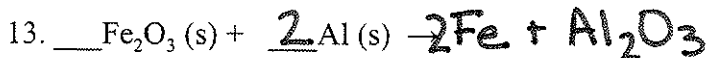
Synthesis



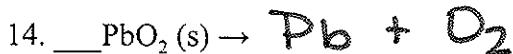
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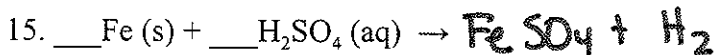
Combustion



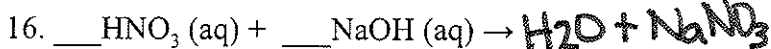
Single Replacement



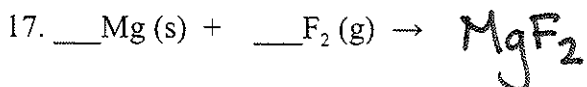
Decomposition



Single Replacement



Double Replacement



Synthesis

LT6: I can differentiate between fission and fusion

LT7: I can distinguish between alpha, beta, gamma decay

18. What is the difference between fission and fusion?

Fusion - two or more atomic nuclei collide at fast speed to form a new nucleus

Fission - decay where a nucleus splits into smaller parts producing neutrons and gamma particles. chain reaction

19. What is nuclear radiation?

unstable nuclei decay to form stable nuclei by releasing particles like alpha, beta, and gamma

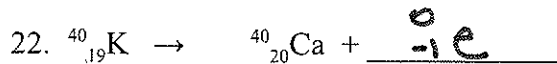
20. What does half-life mean?

amount of time it takes for  $\frac{1}{2}$  particles to decay.

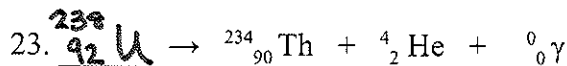
21. Complete the table below to compare the properties of alpha, beta, and gamma radiation.

Name	Alpha	Beta	Gamma
Greek letter	$\alpha$	$\beta$	$\gamma$
Symbol	${}^4_2\text{He}$	${}^0_{-1}\text{e}$ or ${}^0_{-1}\beta$	${}^0_0\gamma$
Composition	2 protons 2 neutrons	1 electron	pure energy
Charge	+2	-1	0
Stopped by	paper, skin, clothing	thin metal	lead, steel, concrete

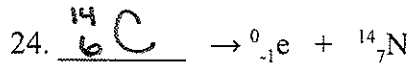
Identify the types of radiation and complete the following nuclear reactions.



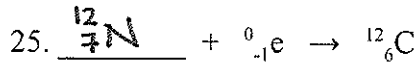
beta decay



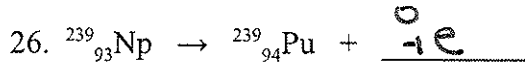
alpha + gamma decay



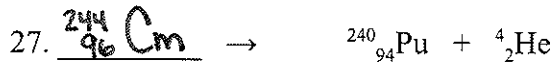
beta decay



electron capture



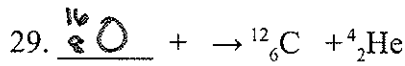
beta decay



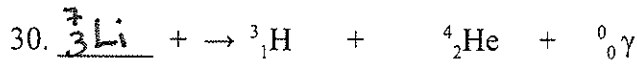
alpha decay



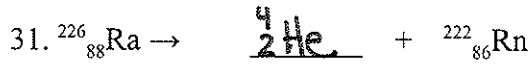
electron capture



alpha decay



alpha + gamma decay



alpha decay



beta decay

Complete this table

Original	beta decay	alpha decay	beta capture	alpha decay	alpha decay	beta decay
90	91	89	88	86	84	85
Th	Pa	Ac	Ra	Rn	Po	At
Thorium	Protactinium	Actinium	Radium	Radon	Polonium	Astatine
232	232	228	228	224	220	220

33.