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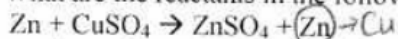
### Chemical Reactions Review

**Test Format: 35 multiple choice, 5 fill-in the blank, 2 write the equation, 3 type of reaction and prediction.**

D 1. A chemical reaction is a process in which:

- a. reactants change into products
- b. substances with new physical and chemical properties are formed
- c. the law of conservation of mass applies
- d. all of the above

\* C 2. What are the reactants in the following chemical equation,



- a. zinc and copper
- b. zinc sulfate and copper
- c. zinc and copper (II) sulfate
- d. only zinc

C 3. What happens to the bonds between atoms in a substance that undergoes a chemical reaction?

- a. all single covalent bonds become double covalent bonds
- b. some existing bonds will weaken while others will strengthen
- c. existing bonds are broken and atoms are rearranged with the formation of new bonds
- d. bonds between atoms are unaffected during a chemical reaction

A 4. In a chemical reaction, the total mass of the substances before the reaction is:

- a. equal to the total mass of the substances after the reaction
- b. usually smaller than the total mass after the reaction
- c. usually greater than the total mass after the reaction
- d. sometimes greater, and sometimes smaller than the total mass after the reaction

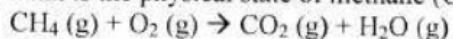
B 5. The numbers used to balance a chemical reaction are called:

- a. superscripts
- b.  coefficients
- c. subscripts
- d. formula units

A 6. Which of the following types of reactions results in a single product?

- a. direct combination reaction
- b. single replacement reaction
- c. double replacement reaction
- d. decomposition

B 7. What is the physical state of methane ( $\text{CH}_4$ ) in the following reaction?



- a. solid
- b. gas
- c. liquid
- d. aqueous

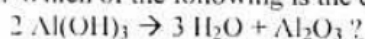
B 8. A combustion reaction typically involves:

- a. the production of a radioactive substance
- b. something being burned
- c. the synthesis of a hydrocarbon
- d. the production of no new substances

A 9. Which of the following symbols indicated the addition of heat to a reaction?

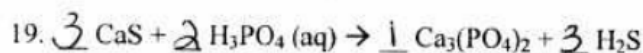
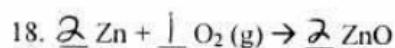
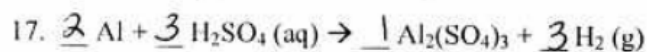
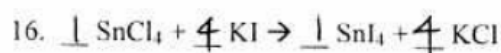
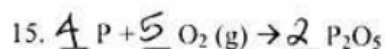
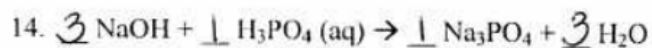
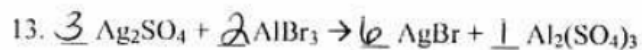
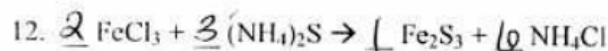
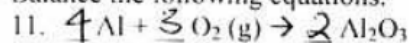
- a.  $\Delta$
- b.  $\rightarrow$
- c.  $\leftrightarrow$
- d. (h)

C 10. Which of the following is the coefficient for water in the following equation:



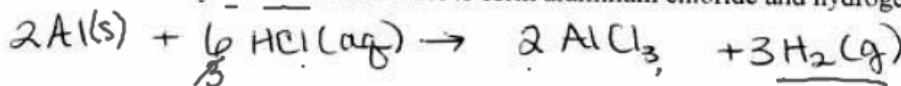
- a. 1      b. 2      c. 3      d. 4

Balance the following equations.

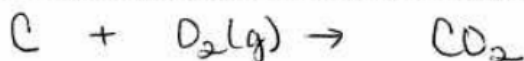


Write the following equations and balance.

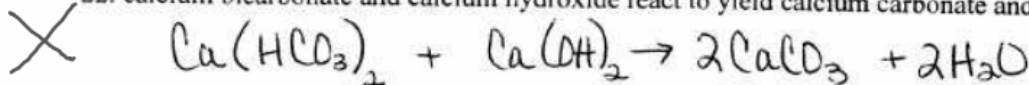
20. aluminum and hydrochloric acid react to form aluminum chloride and hydrogen gas



21. carbon and oxygen gas react to produce carbon dioxide



22. calcium bicarbonate and calcium hydroxide react to yield calcium carbonate and water

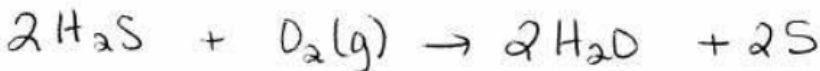


7-diatomics  
H NOF  
Cl  
Br  
I

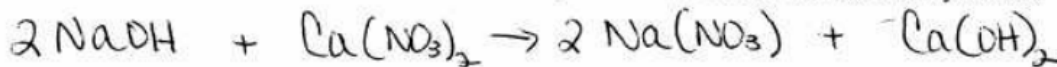
Acid needs hydrogen

pH

22. 23. hydrogen sulfide and oxygen gas react to form water and sulfur



23. 24. sodium hydroxide and calcium nitrate react to yield sodium nitrate and calcium hydroxide



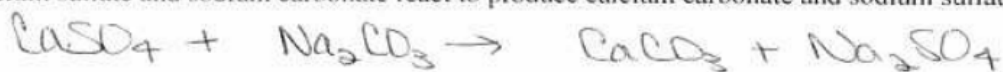
24. 25. potassium iodide and chlorine gas react to form potassium chloride and iodine



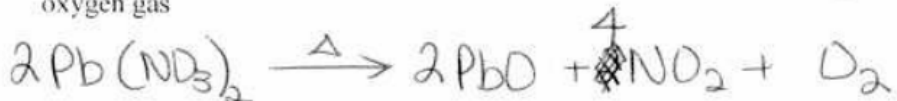
25. 26. sulfuric acid and potassium hydroxide react to produce potassium sulfate and water



27. calcium sulfate and sodium carbonate react to produce calcium carbonate and sodium sulfate



28. lead (II) nitrate when heated decomposes to form lead (II) oxide and nitrogen dioxide and oxygen gas



Indicate the type of reaction and write a balanced equation for the following.

26 29. cadmium nitrate and sulfuric acid  $\xrightarrow{\text{H}_2\text{SO}_4(\text{aq})}$

Type: DR ? elements ? compounds

DR -  $\oplus$  cations change places

27 30. zinc and silver iodide

Type: SR  $e + e \rightarrow \text{comp.}$   
 $e + \text{comp} \rightarrow E + \text{comp}$

SR - like replaces like

28 31. iron (III) chloride and sulfuric acid

Type: DR  $\text{comp} + \text{comp} \rightarrow$

$\text{comp} \rightarrow \text{pieces}$

29 32. bismuth sulfate and ammonium hydroxide

Type: DR

$\oplus$  cations switch

30 33. hydrogen iodide and oxygen

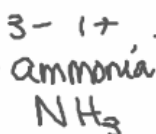
Type: SR

like replaces like

31 34. nitrogen gas and hydrogen gas  $\rightarrow$  ammonia

Type: DC

\* Haber Process



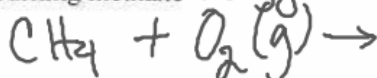
35. barium sulfate and carbon

Type: SR

36. aluminum hydroxide (heated)

Type: DEC

37. burning methane + oxygen  $\rightarrow$  carbon dioxide + water  
Type: combustion - organic



38. hydrochloric acid and sodium hydroxide

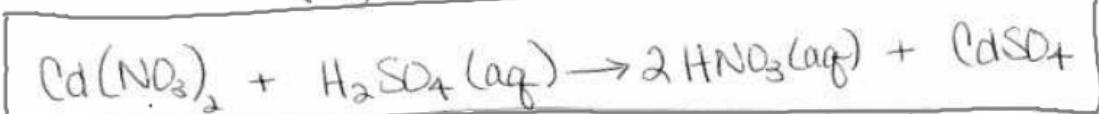
Type: DR

26. All good Cots Zing on Wednesday  
 $\frac{3+}{3+}$   $\frac{1+}{1+}$   $\frac{2+}{2+}$   $\frac{2+}{2+}$   $\frac{6+}{6+}$

DR

27. Cadmium nitrate + sulfuric acid  $\rightarrow$

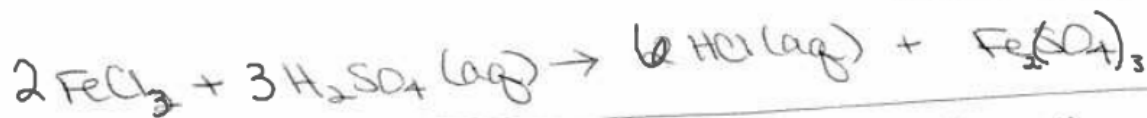
Hydrogen nitrate + cadmium sulfate  
 (~~nitric~~ nitric acid)



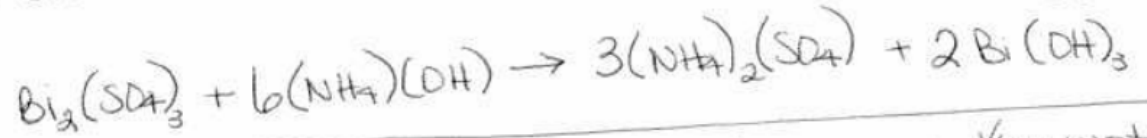
27. Zinc + silver iodide  $\rightarrow$  silver + zinc iodide



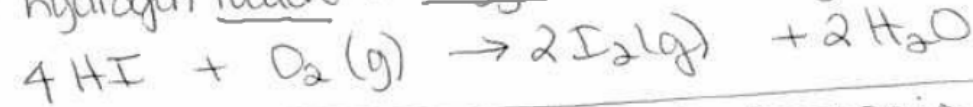
28. Iron(III) chloride + sulfuric acid  $\rightarrow$  hydrochloric acid + iron(III) sulfate



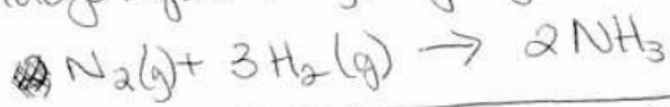
29. bismuth sulfate + ammonium hydroxide  $\rightarrow$  ammonium sulfate + bismuth hydroxide



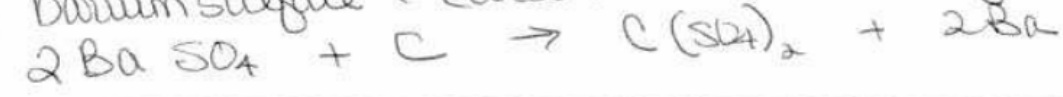
30. hydrogen iodide + oxygen  $\rightarrow$  iodine gas + water



31. nitrogen gas + hydrogen gas  $\rightarrow$  ammonia

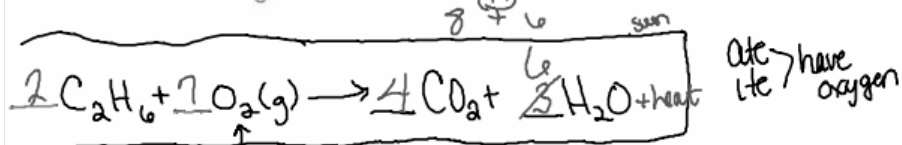
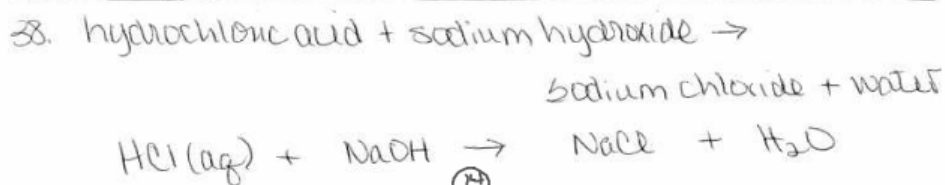
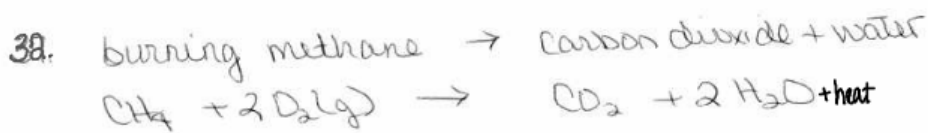


35. barium sulfate + carbon  $\rightarrow$  carbon sulfate + barium

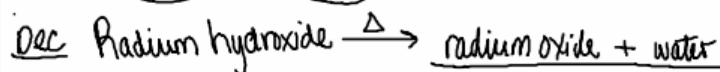
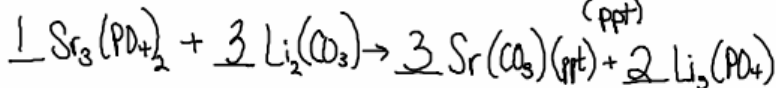
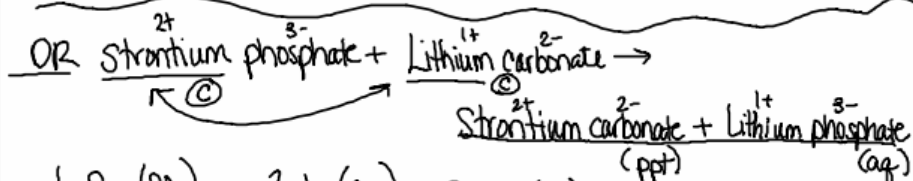
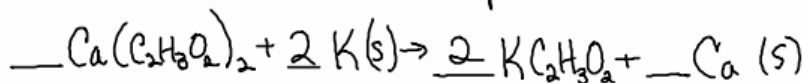
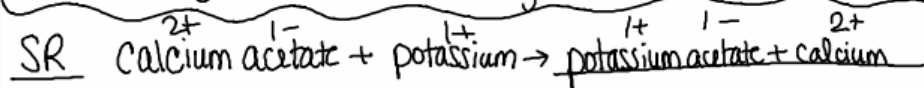
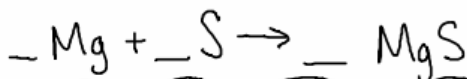
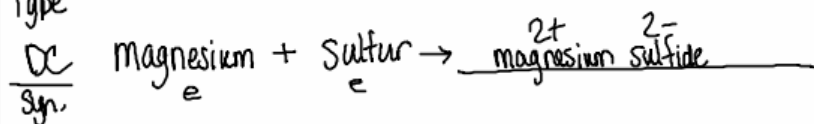


36. Aluminum hydroxide  $\xrightarrow{\Delta}$  aluminum oxide + water





Type



Types of Rxns Hmwk:

