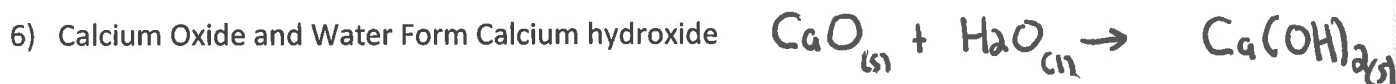
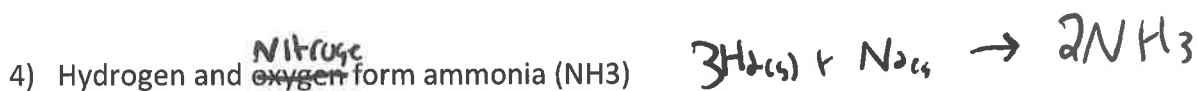
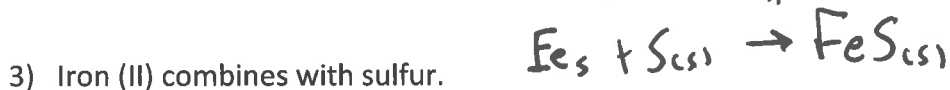
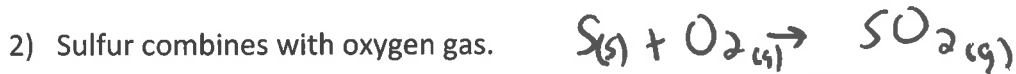
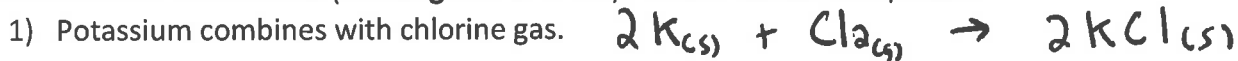


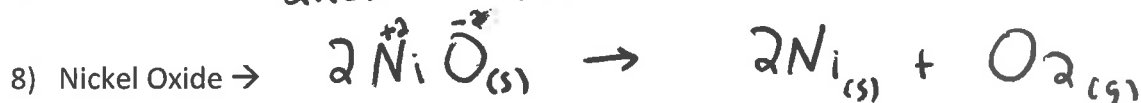
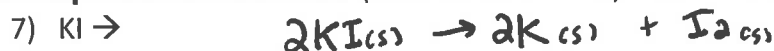
Key

Chemical Reactions

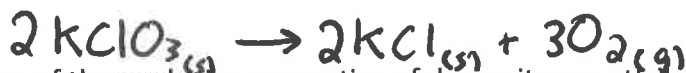
Combination Reactions (marriage $a + b \rightarrow ab$): write a balanced equation



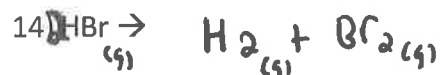
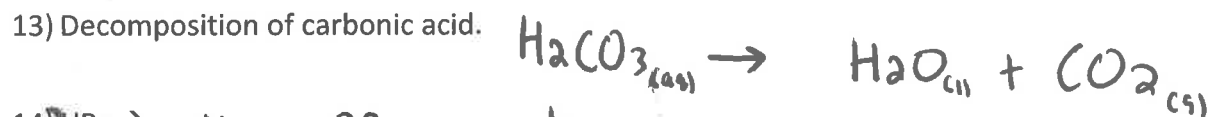
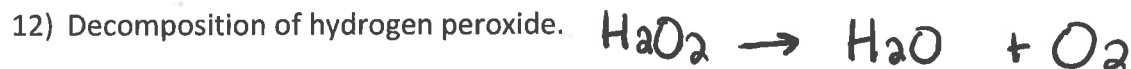
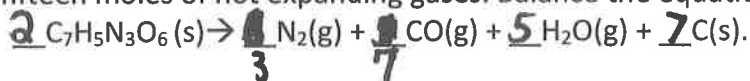
Decomposition reactions (divorce $ba \rightarrow b + a$): write a balanced equation:



10) Potassium chlorate decomposes into potassium chloride and oxygen gas.



11) Some of the explosive properties of dynamite are attributed to a decomposition reaction which produces large amounts of gas! Two moles of TNT or trinitrotoluene is converted into fifteen moles of hot expanding gases. Balance the equation.



Single Replacement Reaction (adultery $ab + c \rightarrow cb + a$): give a balanced equation or N.R.

15) For the following pairs of elements, underline the one that will replace the other

- a. calcium, tin
- b. bromine, fluorine
- c. aluminum, potassium
- d. zinc, sodium
- e. iron, copper
- f. iodine, chlorine
- g. silver, lead

16) lead + zinc acetate \rightarrow NR Lead is lower than zinc and cannot replace it.

17) iron + aluminum oxide \rightarrow NR

18) silver nitrate + nickel



19) sodium bromide + iodine

NR

20) aluminum bromide + chlorine



21) sodium iodide + bromine



22) calcium and hydrochloric acid



23) magnesium and nitric acid



24) silver and sulfuric acid

NR Silver is lower than H

25) potassium and water



26) sodium and water



27) calcium plus water



28) Iron plus lead nitrate



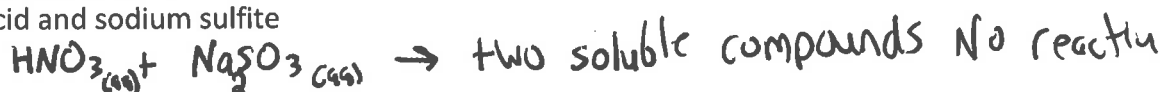
29) What do reactive metals and tend to form in water?

Hydroxide and H_2 Gas

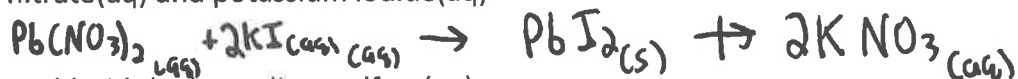
Double Displacement Reactions (partner swap $ab + cd \rightarrow ad + cb$):

write a balanced equation for each one or indicate N.R.

30) Nitric acid and sodium sulfite



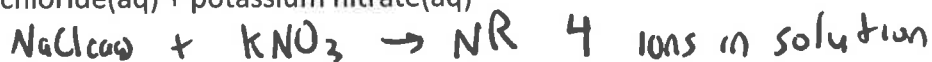
31) Lead nitrate(aq) and potassium iodide(aq)



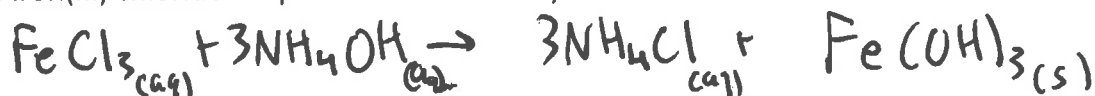
32) Barium chloride(aq) + sodium sulfate(aq)



33) Sodium chloride(aq) + potassium nitrate(aq)



34) Aqueous iron(III) chloride + aqueous ammonium hydroxide



Combustion Reactions (the fuego!)

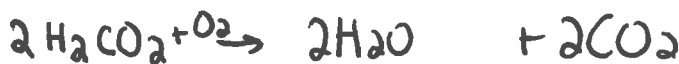
35) Benzene C_6H_6



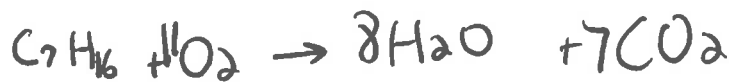
36) Ethanol $\text{CH}_3\text{CH}_2\text{OH}$



37) Formic Acid HCOOH



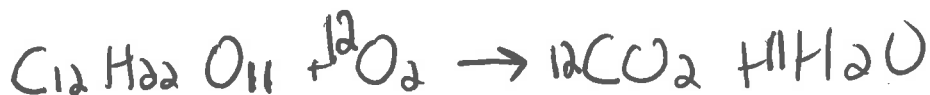
38) Heptane C_7H_{16}



39) Glucose $\text{C}_6\text{H}_{12}\text{O}_6$



40) Sucrose $\text{C}_{12}\text{H}_{22}\text{O}_{11}$



Questions:

41) Does steel wool get heavier, lighter or stay the same during combustion? Explain.

Heavier Iron is combining with Oxygen. Iron oxide has a heavier molar mass.

42) Magnesium metal can be used to remove tarnish from silver items. Silver tarnish is the corrosion that occurs when silver metal reacts with substances in the environment, especially those containing sulfur. Why would magnesium remove tarnish from silver?

Magnesium can replace the silver as it is higher up on the reactivity series.

43) Use the activity series for metals to explain why copper metal is used in plumbing where the water might contain compounds of many different metals.

Copper is very low on the reactivity series and will not replace other metals in solution.

44) The last four metals in the activity series of metals are commonly referred to as the "coinage metals." Why would these metals be chosen over more active metals for use in coins? Why do you think some more active metals, such as zinc or nickel, are sometimes used in coins? You want money that will not react with other metals.

45) What is heap leaching?

46) What is gold cyanidation?

47) You mean Aluminum foil, seriously? The French government once displayed Fort Knox-like aluminum bars next to the crown jewels, and the minor emperor Napoleon III reserved a prized set of aluminum cutlery for special guests at banquets. (Less favored guests used gold knives and forks.) The United States, to show off its industrial prowess, even capped the Washington monument with a six-pound pyramid of aluminum in 1884. Aluminum was once worth more than gold. Explain why referencing the activity series.

48) How can you dissolve gold which is on the bottom of the activity series? One method.

3:1 HCl and HNO₃ or HCl + H₂O₂

49) Explain how and why surface area, concentration and temperature effect the rate of chemical reactions. >SA > Reactm Rate. More contact area for reactions to occur.

More concentration more reactions (higher rate)

More likely for molecules/particles to collide

50) How does a match work?

Red Phosphorus
to
White Phosphorus
then

KClO₃

decomposes releasing energy



Activity Series

Metals

Decreasing Activity

Halogens

Lithium
Potassium
Calcium
Sodium
Magnesium
Aluminum
Zinc
Chromium
Iron
Nickel
Tin
Lead
Hydrogen*
Copper
Mercury
Silver
Platinum
Gold

Chlorine
Fluorine
Bromine
Iodine



A In general, a metal can displace any of the metals which are lower in the reactivity series. Same rule is applied for halogens.