Quiz 5A

1. Interpret the balanced chemical reaction (6 points):

PCl5 (g) + 92.9 kJ 🡪 PCl3 (g) + Cl2 (g)

1. in terms of the number of moles of each substance involved:

\_\_\_1\_\_ mole(s) of PCl5 absorbs \_\_92.9\_\_\_ kJ of energy to produce \_\_\_1\_\_ mole(s) of PCl3 and \_\_1\_\_\_ mole(s) of Cl2.

1. indicate whether the reaction is exothermic or endothermic.
2. type of reaction: \_\_\_\_\_\_\_decomposition or oxidation-reduction reaction \_\_\_
3. Change these word equations into formula equations and balance them. Be sure to use the proper symbols to indicate the state of each substance, as given (13 points).
   1. Upon heating, solid magnesium carbonate, MgCO3, decomposes into solid magnesium oxide and carbon dioxide, CO2, gas.

MgCO3 (s) MgO (s) + CO2 (g)

* 1. Solid calcium hydroxide, Ca(OH)2, reacts with aqueous chloric acid, HClO3, to form a solution of calcium chlorate along with liquid water.

Ca(OH)2 (s) + 2 HClO3 (aq) 🡪 Ca(ClO3)2 (aq) + 2 H2O (l)

* 1. Solutions of iron(III) sulfate, Fe2(SO4)3 and sodium hydroxide, NaOH, are mixed together, forming solid iron(III) hydroxide and a solution of sodium sulfate.

Fe2(SO4)3 (aq) + 6 NaOH (aq) 🡪 2 Fe(OH)3 (s) + 3 Na2SO4 (aq)

1. Oxidation is the (loss/gain) of electrons (1 point).

Quiz 5B

1. Reduction is the (loss/gain) of electrons (1 point).
2. Change these word equations into formula equations and balance them. Be sure to use the proper symbols to indicate the state of each substance, as given (13 points).
   1. Solutions of sodium carbonate, Na2CO3, and cobalt(II) chloride, CoCl2, react to form solid cobalt(II) carbonate and a solution of sodium chloride.

Na2CO3 (aq) + CoCl2 (aq) 🡪 CoCO3 (s) + 2 NaCl (aq)

* 1. Zinc metal is placed into a solution of acetic acid, HC2H3O2, producing hydrogen gas and aqueous zinc acetate.

Zn (s) + 2 HC2H3O2 (aq) 🡪 H2 (g) + Zn(C2H3O2)2 (aq)

* 1. Gaseous sulfur trioxide, SO3, reacts with liquid water to form a solution of sulfuric acid, H2SO4.

SO3 (g) + H2O (l) 🡪 H2SO4 (aq)

1. Interpret the balanced chemical reaction (6 points):

S (s) + 2 CO (g) 🡪 SO2 (g) + 2 C (s) + 76 kJ

1. in terms of the number of moles of each substance involved:

\_\_\_1\_\_ mole(s) of solid sulfur will react with \_\_\_2\_\_ mole(s) of gaseous carbon monoxide to produce \_\_\_1\_\_ mole(s) of gaseous sulfur dioxide, \_\_\_2\_\_ mole(s) of solid carbon, and release \_\_\_76\_\_ kJ of energy.

1. indicate whether the reaction is exothermic or endothermic.
2. type of reaction: \_\_\_\_single replacement or oxidation-reduction reaction\_\_\_