TEST 3 REVIEW

1. Balance each reaction below::

a)
$$\underline{\hspace{1cm}}$$
 Al + $\underline{\hspace{1cm}}$ H₃PO₄ \longrightarrow $\underline{\hspace{1cm}}$ AlPO₄ + $\underline{\hspace{1cm}}$ H₂

b)
$$\underline{\hspace{1cm}}$$
 NH₄Cl + $\underline{\hspace{1cm}}$ NaNO₃ \longrightarrow $\underline{\hspace{1cm}}$ NaCl + $\underline{\hspace{1cm}}$ H₂O + $\underline{\hspace{1cm}}$ N₂O

c)
$$\underline{\hspace{1cm}}$$
 Cl₂ + $\underline{\hspace{1cm}}$ NaOH \longrightarrow $\underline{\hspace{1cm}}$ NaCl + $\underline{\hspace{1cm}}$ NaClO + $\underline{\hspace{1cm}}$ H₂O

d)
$$\underline{\hspace{1cm}} Pb(NO_3)_2 \longrightarrow \underline{\hspace{1cm}} PbO + \underline{\hspace{1cm}} NO_2 + \underline{\hspace{1cm}} O_2$$

e)
$$\underline{\hspace{1cm}} C_3H_8 + \underline{\hspace{1cm}} O_2 \longrightarrow \underline{\hspace{1cm}} CO + \underline{\hspace{1cm}} H_2O$$

- 2. For each reaction below, determine the substance oxidized and the substance reduced:
 - a) $2 \text{ Na (s)} + \text{Cl}_2(g) \rightarrow 2 \text{ NaCl (s)}$

oxidized:

reduced: _____

b) $HCO_2H + O_2 \rightarrow CO_2 + H_2O$

oxidized: _____ reduced: _____

c) $ZnCl_2(aq) + Mg(s) \rightarrow MgCl_2(aq) + Zn(s)$

oxidized: _____ reduced: ____

d) Fe^{2+} (s) + Cu^{2+} (aq) \rightarrow Fe^{3+} (aq) + Cu^{+} (aq)

oxidized:

reduced: _____

3. For each half-reaction shown below (a) determine if it is written correctly, and (b) if correct, classify as oxidation or reduction:

a)
$$Cu^{2+} + 2e^{-} \rightarrow Cu$$

b)
$$Mg^{2+} \rightarrow Mg + 2e^{-}$$

c)
$$Fe^{2+} \rightarrow Fe^{3+} + e^{-}$$

d)
$$Al^{3+} + 3e^- \rightarrow Al$$

e) Pb +
$$2 e^- \rightarrow Pb^{2+}$$

4. Use the balanced equation shown below to answer the following questions:

$$4 K + O_2 \longrightarrow 2 K_2O$$

a) How many moles of O₂ are required to completely react with 0.56 moles of K?

b) How many grams of K_2O can be formed from reaction of 0.65 moles of O_2 ?

c) How many grams of K₂O can be formed from reaction of 5.00 g of K and 2.00 g of O₂?

5. Use the balanced equation shown below to answer the following questions:

$$Fe_3O_4 + 4 CO \longrightarrow 3 Fe + 4 CO_2$$

- a) How many grams of CO₂ can be prepared from reaction of 0.575 mol of Fe₃O₄?
- b) In one experiment, 100.0 g of CO reacted with excess Fe₃O₄ to produce 141.3 g of Fe. What is the percent yield for this reaction?

6. Use the balanced equation shown below to answer the following questions:

$$C_5H_{12}+8\ O_2 \ \longrightarrow \ 5\ CO_2+6\ H_2O$$

a) How many moles of carbon dioxide are produced from reaction of 35.0 g of C₅H₁₂?

b) How many grams of water are produced from reaction of 75.0 g of C_5H_{12} and 125 g of O_2 ?

Answers:

- 1. No answer provided.
- 2. a) oxidized: Na reduced: Cl
 - b) oxidized: HCO₂H reduced: O₂
 - c) oxidized: Mg reduced: Zn
 - d) oxidized: Fe²⁺ reduced: Cu²⁺
- 3. a) reduction
 - b) incorrect
 - c) oxidation
 - d) reduction
 - e) incorrect
- 4. a) 0.14 mol O₂
 - b) $120 \text{ g K}_2\text{O}$ (2 sig figs)
 - c) $6.0 \text{ g of } K_2O$ (2 sig figs)
- 5. a) 101 g CO₂ (3 sig figs)
 - b) 94.49% (4 sig figs)
- 6. a) 2.42 mol CO₂ (3 sig figs)
 - b) 52.8 g H₂O (3 sig figs)