**Review Assignment**

**Brown & Lemay**

**#25**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Symbol | 52Cr |  |  |  |  |
| Protons |  | 30 |  |  | 82 |
| Neutrons |  | 25 | 64 |  |  |
| Electrons |  |  | 48 | 86 |  |
| Mass number |  |  |  | 222 | 207 |

#26

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Symbol | 65Zn |  |  |  |  |
| Protons |  | 44 |  |  | 92 |
| Neutrons |  | 57 | 49 |  |  |
| Electrons |  |  | 38 | 47 |  |
| Mass number |  |  |  | 108 | 235 |

#49

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Symbol | 59Co+3 |  |  |  |
| Protons |  | 34 | 76 | 80 |
| Neutrons |  | 46 | 116 | 120 |
| Electrons |  | 36 |  | 78 |
| Net Charge |  |  | 2+ |  |

#50

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Symbol | 31P3- |  |  |  |
| Protons |  | 35 | 49 |  |
| Neutrons |  | 45 | 66 | 118 |
| Electrons |  |  | 46 | 76 |
| Net Charge |  | 1- |  | 3+ |

Chapter 3

#12 Balance the following equations:

1. Li(s) + N2 (g) --> Li3N (s)
2. La2O3(s) + H2O (l) --> La(OH)­3 (aq)
3. Ca3P2(s) + H2O (l) --> Ca(OH)2 (aq) + PH3 (g)
4. AgNO3 (aq) + Na2SO4 (aq) --> Ag2SO4 (s) + NaNO3 (aq)

#13 Write a balanced chemical equation for the reaction that occurs when:

1. Copper (II) hydroxide decomposes into copper (II) oxide and water when heated.
2. Heptane, C7H16 (l), burns in air.
3. C5H12O (l) burns in air.

#21 Determine formula weights for the following:

1. HNO3, Chromium (III) sulfate, benzoic acid, HC­7­H5O2.

#34 and 36 Calculate the following quantities.

1. mass, in grams, of 5.76 x 10-3 mol of CdS
2. Number of moles of NH4Cl in 112.6 g of the substance.
3. Mass, in grams, of 0.0714 mol of iron III sulfate

#44

Determine the empirical formula of a compound that contains 0.104 mol of K, 0.052 mol C and 0.156 mol O

A compound that is 24.5 % mass Na, 14.9 %mass Si, 60.6 % mass F

#48

What is the molecular formula of a compound that has an empirical formula of CH2 and a molar mass of 84g/mol

empirical formula of : HCO2 molar mass 90.0 g/mol

#50 Determine empirical and molecular formulas of:

1. Ibuprofin 75.69% C, 8.80% H, and 15.51 % O Molar mass 206g/mol
2. Cadaverine, 58.55% C, 13.81 % H, 27.40% N Molar mass 102.2 g/mol
3. Epinephrine, 59.0%C, 7.1 %H, 26.2 % O, and 7.7% N molar mass, about 180 g/mol

#60

An iron ore sample contains Fe2O3 and reacts with CO to produce Iron metal

Fe2O3 (s) + CO(g) --> Fe(s) + CO2 (g)

Balance the equation

Calculate the number of grams of CO that are required to react with 0.150 kg of Fe­2O3 (s)

Calculate the number of grams of Fe and number of grams of CO­2 that form when 0.150 kg of Fe2O3 react

#64

C8H18(l) + O2 --> CO2 (g) + H2O (l)

Balance the equation above for the combustion of octane

How many moles of O2 are needed to burn 1.25 mol of C8H18?

How many grams of water are produced from the combustion of 10.0 g of octane?

Octane has a density of 0.692 g/ml. How many grams of O2 are required to burn 0.500 L of octane?

#59

Many antacids contain aluminum hydroxide as the active ingredient to react with stomach acid, HCl.

Al(OH)3 (s) + HCl (aq) 🡪 AlCl3 (aq) + H2O (l)

1. Balance the equation above.
2. Calculate the number of grams of HCl that can react with 0.500 g of Al(OH)3 (s)
3. Find the mass of water and aluminum chloride formed when 0.500 g of Al(OH)3 react.
4. Show how the calculations from b) and c) above are consistent with the law of conservation of mass

#61

Aluminum sulfide reacts with water to form aluminum hydroxide and hydrogen sulfide.

1. Write a balanced chemical reaction for this reaction.
2. How many grams of aluminum hydroxide are obtained from the reaction of 14.2 g of aluminum sulfide?

#71

Sodium hydroxide reacts with carbon dioxide to form sodium carbonate and water. Determine the limiting reactant when 68.00 g of sodium hydroxide react with 44.00 g of carbon dioxide. What mass of sodium carbonate are formed? How many grams of the excess reactant remain after the reaction is complete?

#72 Aluminum hydroxide reacts with sulfuric acid as follows:

2 Al(OH)3 (s) + 3 H2SO4 (aq) 🡪 Al2(SO4)3 (aq) + 6H2O (l)

Which reagent is the limiting reactant when 0.500 mol Al(OH)3 and

0.500 mol H2SO4are allowed to react? How many moles of aluminum sulfate, Al2(SO4)3 are formed under these conditions? How many moles of the excess reactant remain after the completion of the reaction?