Name: _____ Block: _____

PRACTICE: Chemistry 11 Review Quiz

Answer all questions in the space provided. Show all work, including significant figures, for calculations.

Significant Figures & Scientific Notation

1. State the number of significant figures and write each of the following numbers in scientific notation:
   a. 0.0120020 1.20020×10^{-2} (6 s.f.)
   b. 8800.0 8.8000×10^{3} (5 s.f.)

2. Perform the indicated operation(s) and give the answer to the correct number of significant figures:
   a. (12.0)(2.2250) = __26.7__

   b. $7895 + 2.8 \times 10^3$ = __10700__

   $$\begin{array}{r} 7895 \\ + 2800 \\ \hline 10695 \end{array}$$

   c. (15.0 + 2.3000) / (15.95 + 0.1095) = __1.07__
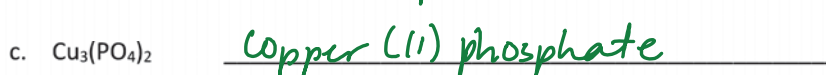   17.3   16.06

Unit Conversions

3. 15.5 km into nm __1.55×10^{3} nm__ $15.5 \text{ km} \times \dfrac{10^3 \text{ m}}{1 \text{ km}} \times \dfrac{1 \text{ nm}}{10^{-9} \text{ m}}$

4. 9.3 mg/s into g/min __0.56 g/min__ $\dfrac{9.3 \text{ mg}}{s} \times \dfrac{10^{-3} g}{1 \text{ mg}} \times \dfrac{60 s}{1 \text{ min}}$

Chemical Names and Formulas

5. Write the correct name for each of the following:
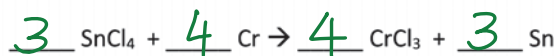   a. MgBr __magnesium bromide__

   b. I_2O_5 __diiodine pentoxide__

   c. $Cu_3(PO_4)_2$ __Copper (II) phosphate__

6. Write the correct formula for each of the following:
   a. Phosphorus trifluoride __PF_3__

   b. Strontium chloride __$SrCl_2$__

   c. Copper (II) dichromate __$CuCr_2O_7$__

Writing, Balancing, & Classifying Chemical Reactions

7. Balance the following reaction:

   __3__ $SnCl_4$ + __4__ Cr → __4__ $CrCl_3$ + __3__ Sn

   What type of reaction is this? __Single replacement__

8. Write a balanced equation for the following reaction:
   Iron(II) chloride reacts with potassium sulphide to produce iron(II) sulphide and potassium chloride.

   $$FeCl_2 + K_2S \longrightarrow FeS + 2KCl$$

9. Complete and balance the following reaction.
   Classify as (circle the correct answer): synthesis, decomposition, single replacement, double replacement, neutralization, or (combustion)

   __1__ C_4H_8S + __7__ O_2 → __4__ CO_2 + __4__ H_2O + __SO_2__

Mole Calculations

10. Calculate the mass in grams of 2.57 moles of NH_3.

    $$2.57 \, mol \, NH_3 \times \frac{17.0g}{1mol} = 43.7 \, g \, NH_3$$

11. A sample of cobalt was determined to have 8.65×10^{25} atoms. Calculate the mass of this sample.

    $$8.65 \times 10^{25} \, atoms \times \frac{1mol}{6.02 \times 10^{23} \, atoms} \times \frac{58.9g}{1mol} = 8.46 \times 10^3 \, g$$

12. Calculate the volume at STP occupied by 3.25 kg of $C_2H_6(g)$?

    $$3.25 \, kg \times \frac{10^3 g}{1kg} \times \frac{1mol}{30.0g} \times \frac{22.4L}{1mol} = 2430 \, L$$

Stoichiometry

13. According to the following reaction, the number of grams of methane (CH_4) produced when 150.8 g of aluminum carbide is reacted in the presence of excess oxygen is:

$$Al_4C_3 + 12\ H_2O \rightarrow 4\ Al(OH)_3 + 3\ CH_4$$
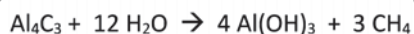
$$150.8g\ Al_4C_3 \times \frac{1\ mol}{144.0\ g} \times \frac{3\ mol\ CH_4}{1\ mol\ Al_4C_3} \times \frac{16.0\ g}{1\ mol} = 50.3\ g$$

14. Using the following reaction, calculate the number of litres of nitrogen monoxide gas produced at STP from the reaction of 17.7 g of nitrogen dioxide. $3\ NO_2 + H_2O \rightarrow 2\ HNO_3 + NO$

$$17.7g\ NO_2 \times \frac{1\ mol}{46.0\ g} \times \frac{1\ mol\ NO}{3\ mol\ NO_2} \times \frac{22.4L}{1\ mol} = 2.87\ L$$

Solutions & Molarity

15. What volume of 3.5 M $CuSO_4$ solution is produced with 0.728 mol of solute is dissolved?

$$0.728\ mol \times \frac{1L}{3.5\ mol} = 0.208\ L$$

16. If 163.4 g of $Ni(NO_3)_2$ is dissolved in 865.0 mL of solution, what is the resulting molarity?

$$163.4g \times \frac{1\ mol}{182.7g} = \frac{0.8943\ mol}{0.8650\ L} = 1.034\ M$$

17. What concentration of $MgCl_2$ solution is made by diluting 750.0 mL of 2.850 M NaCl to 4.5 L?

$$C_2 = \frac{C_1 V_1}{V_2} = \frac{(2.850\ M)(0.7500\ L)}{(4.5\ L)} = 0.48\ M$$