Name _____
Date _____
Due Date _____

Mark _____ /24

Chemistry 11

Mass, Mole, Volume Conversions

1. Make the following conversions, clearly showing your steps. Include proper units in all of your work and in your answer. Use your periodic table and express all molar masses to 1 decimal place.

   a. 137.5 grams of PCl_3 = ? moles (2 marks)

   Answer __1.001 mol PCl_3__

   b. 0.00256 moles of $SrCrO_4$ = ? grams (2 marks)

   Answer __0.521 g $SrCrO_4$__

   c. 92.288 L of NO_2 at STP = ? moles (2 marks)

   Answer __4.12 mol NO_2__

   d. 3.2 x 10^2 moles of SO_3 gas at STP = ? L (2 marks)

   7170L SO_3

   Answer __7200L SO_3__
   (7.2x10^3L SO_3)

$\boxed{\dfrac{}{8}}$

e. 806.895 g of PCl_5 gas = ? L (STP) (4 marks)

Answer __86.8 L PCl_5__

f. 3136 mL of CH_4 gas at STP = ? g (4 marks)

Answer __2.25 g CH_4__

g. 2.25 kg of nitrogen gas = ? L (STP) (4 marks)
* nitrogen is a diatomic element.

1799 L N_2

Answer __1.80 × 10³ L N_2__

h. 0.00285 kg of $C_2H_{6(g)}$ = ? mL (4 marks)

2122.34 mL

Answer __2120 mL__

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Chemistry 11

Summary of Mole Conversions

1. Make the following conversions, clearly showing your steps. Include proper units in all of your work and in your answer. Express all molar masses to 1 decimal place.

   a. 239.76 g of SeO_2 = ? molecules (4 marks)

   Answer __*1.30 × 10²⁴ molecules*__

   b. 0.6048 L of NO_2 (STP) = ? molecules (4 marks)

   Answer __*1.63 × 10²² molecules*__

   c. 7.826 x 10^{21} molecules of CH_4 = ? L (STP) (4 marks)

   Answer __*0.291 L*__

$$\frac{}{12}$$

d. 28.732 g of C_3H_8 = ? "H" atoms (4 marks)

Answer 3.14×10^{24} H atoms

2. Calculate the density of PCl_3 gas at STP. (4 marks)

$d = \dfrac{molar\ mass}{molar\ volume} = \dfrac{\frac{g}{mol}}{\frac{L}{mol}} = \dfrac{g}{L}$

you need to know this.

Answer $6.13\ g/L$

3. The density of a gas is 2.589 g/L at STP. Calculate the molar mass of the gas. (4 marks)

Answer $58.0\ g/mol$

4. What is the volume occupied by 0.2625 moles of solid silver if it has a density of 10.5 g/mL? (4 marks)

$d = \dfrac{mass}{vol.} \quad \therefore V = \dfrac{m}{d}$

you need to know this.

Answer $2.70\ mL$
$(0.00270\ L)$

5. An oxide of nitrogen is known to be either NO, N_2O, NO_2 or N_2O_4. The mass of 0.800 L of this gas at STP is found to be 1.643 g.
   a. Determine the molar mass of the gas. (4 marks)

Answer $46.0\ g/mol$

   b. Give the molecular formula for the gas. (1 mark) Answer NO_2

$\dfrac{}{21}$