Teacher Name: Lillie Student Name: _____

Class: CP (NGSS) Chemistry

Period: P1, P2, P3, P6

Assignment: Assignment Week 4

Due: ***Friday, 5/15***

Mole Conversions

General Instructions:

Please do the activities for each day as indicated. You will work the problems on separate sheets of paper as necessary that you will attach to the completed packet that you submit. Be sure your name is on all sheets of paper.

Submitted Work:

1) Reading notes from section 10.1
2) Completed practice problems and section assignment from Tuesday
3) Completed Molar Mass problems from Wednesday through Friday

Questions:

1) Please send email as you have questions and/or attend virtual office hours.

Date	Activity
Monday (5/4)	Read Section 10.2 Take reading notes. Be able to work through all sample problems.
Tuesday (5/5)	Do practice problems 16-23 showing all your work
Wednesday (5/6)	Molar Particle Conversion problems (below) 1-5
Thursday (5/7)	Mole Mass Conversion problems (below) 6-11
Friday (5/8)	Mole Volume Conversion problems (below) 12-16

Mole Conversions

There are three mole equalities. They are:

1 mol = 6.022×10^{23} particles 1 mol = molar mass in g (periodic table) 1 mol = 22.4 L for a gas at STP	$\left(\frac{1\ mole}{6.02x10^{23}\ particles}\right)$	$\left(\frac{6.02x10^{23}\ particles}{1\ mole}\right)$
	$\left(\frac{1\ mole}{22.4\ L}\right)$	$\left(\frac{22.4\ L}{1\ mole}\right)$

Mole-Particle Conversions

1. How many moles of magnesium is 3.01×10^{22} atoms of magnesium?

Start w/ the end in mind:

$$?\ mol\ Mg = 3.01 \times 10^{22}\ atoms\ Mg \times \frac{1\ mol\ Mg}{6.02 \cdot 10^{23}\ atoms\ Mg}$$

$$= 0.05\ mol\ Mg$$

$$= 0.0500\ mol\ Mg = 5.00 \cdot 10^{-2}\ mol\ Mg$$

Note: final answer has 3 significant figures

2. How many molecules are there in 4.00 moles of glucose, $C_6H_{12}O_6$?
3. How many moles are 1.20×10^{25} atoms of phosphorous?
4. eHow many atoms are in 0.750 moles of zinc?
5. How many molecules are in 0.400 moles of N_2O_5?

Mole-Mass Conversions

6. How many moles in 28 grams of CO_2 ?

Setup: $?\,mol\,CO_2 = 28\,g\,CO_2 \cdot \frac{1\,mol\,CO_2}{43.99\,g\,CO_2}$

$= 0.636508297\,mol$

$= 0.64\,mol\,CO_2$ (2 sig figs)

Molar mass CO_2:

C: 12.01

2O: 2(15.99)

43.99

7. What is the mass of 5 moles of Fe_2O_3 ?
8. Find the number of moles of argon in 452 g of argon.
9. Find the grams in 1.26×10^{-4} mol of $HC_2H_3O_2$.
10. Find the mass in 2.6 mol of lithium bromide.
11. How many moles are in 82 kg of Xe?

Mole-Volume Conversions

12. How many moles of oxygen are present in 3.36L of oxygen at STP

$?\,mol\,O_2 = 3.36\,L\,O_2 \cdot \frac{1\,mol}{22.4\,L}$

$= 0.15\,mol\,O_2$

$= 0.150\,mol\,O_2$ (3 sig figs)

13. Determine the volume, in liters, occupied by 0.030 moles of a gas at STP.
14. How many moles of argon atoms are present in 11.2 L of argon gas at STP?
15. What is the volume of 0.05 mol of neon gas at STP?
16. How many moles of O_2 atoms are present in 25 mL of O_2 gas at STP?