

Assignment 5K – Unit 5 Review – The mol and Molar Conversions 20 Points
 Determine the atomic mass (amu), and molar mass (g/mol) for the following isotopes, and the average atomic mass (amu and g/mol) based on the periodic table.

Isotope	Fluorine- <u>18</u>	Fluorine- <u>19</u>	Fluorine- <u>20</u>
Atomic Mass (amu)	18 amu	19 amu	20 amu
Molar Mass (g/mol)	18 g/mol	19 g/mol	20 g/mol
Avg Atomic Mass (g/mol, periodic table)	19.00 g/mol	← on the PT --- g/mol	

For the following use the given molar mass to perform the following conversions

Convert <u>69.2g Mg</u> to <u>mol Mg</u> From PT		Convert <u>0.93mol Co</u> to <u>mass Co</u>	
Molar Mass Mg	24.31 g/mol	Molar Mass Co	58.93 g/mol
69.2 g Mg *	1 mol Mg *	0.93 mol Co	58.93 g Co
	24.31 g Mg *		1 mol Co
mol Mg	2.85 mol Mg **	mass Co	54.80 g Co

mol is always "1"

Round to 2 "after" decimal

Ir₃P
 Ir₃P₁
 576.66
 + 30.97
 607.63

Iridium(I)Phosphide [Ir ₃ P]		
Element	#	Molar Mass
Iridium (Ir)	3	192.22 g
Phosphorous (P)	1	30.97 g
Iridium(I)Phosphide [Ir ₃ P]		607.63 g/mol

Tungsten(IV)Carbonate [W(CO ₃) ₃]		
Element	#	Molar Mass
Tungsten (W)	1	183.84 g/mol
Carbon (C)	3	12.01 g/mol
Oxygen (O)	9	16.00 g/mol
Tungsten(IV)Carbonate [W(CO ₃) ₃]		363.87 g/mol

W(CO₃)₃
 W +
 (CO₃)₃
 (C₁O₃)₃
 183.84
 + 36.03
 + 144.00
 363.87
 Round to 2 after dec.

Convert <u>79.28g Ir₃P</u> to <u>mol Ir₃P</u>	
79.28 g Ir ₃ P	1 mol Ir ₃ P
	607.63 g Ir ₃ P
Mol Ir ₃ P	0.13 mol Ir ₃ P

Convert <u>1.32mol W(CO₃)₃</u> to <u>mass W(CO₃)₃</u>	
1.32 mol W(CO ₃) ₃	363.87 g W(CO ₃) ₃
	1 mol W(CO ₃) ₃
Mass W(CO ₃) ₃	480.31 g W(CO ₃) ₃

[0.130474...] Round to 2 after decimal

Molarity Equations for Solutions

M = Molarity (mol/L) n = Mol (mol) V = Liters (L)

$$M \text{ (mol/L)} = \frac{n \text{ (mol)}}{V \text{ (L)}} \quad n \text{ (mol)} = M \cdot V \text{ (mol/L} \cdot \text{L)} \quad V \text{ (L)} = \frac{n \text{ (mol)}}{M \text{ (mol/L)}}$$

Convert the following volume measurements to mol, or mol to volume ($1 \text{ mol} = 22.4 \text{ L}$)

multiply
 84.29×1
 22.4
 divide

Convert <u>84.29 L</u> <u>SO₃(g)</u> to <u>mol</u> <u>SO₃(g)</u>	
84.29 L SO₃	1 mol SO ₃
	22.4 L SO₃
mol SO ₃ (g)	3.76 mol SO ₃

Convert <u>1.74 mol</u> <u>Br₂(g)</u> to <u>volume</u> <u>Br₂(g)</u>	
1.74 mol Br ₂	22.4 L Br₂
	1 mol Br ₂
volume Br ₂ (g)	38.98 L Br ₂

Volume
 $V = L$

Solve the following solution concentration problems

Use equations above to fill in work!
 $M = \frac{n}{V}$
 Round to 2 after decimal

$n = 0.78 \text{ mol}$ $V = 1.58 \text{ L}$ $M = \underline{\hspace{2cm}} \text{ mol/L}$
$M = \frac{0.78 \text{ mol}}{1.58 \text{ L}}$
$M = 0.49 \text{ mol/L}$

$M = 2.40 \text{ mol/L}$ $V = 2.14 \text{ L}$ $n = \underline{\hspace{2cm}} \text{ mol}$
$n = 2.40 \frac{\text{mol}}{\text{L}} \times 2.14 \text{ L}$
$n = 5.14 \text{ mol}$

$n = M \cdot V$
 $M = \text{mol/L}$
 $V = L$

(0.493670...)

↳ 0-4: same (5-9: round up)