DP CHEM SUMMER ASSIGNMENT
Incoming 11th graders
Summer 2023

1. Due first day of class (in order to do lab): **Watch the safety video (safety video by American Chemical society)** and answer the Safety quiz (front and back)
   https://www.youtube.com/watch?v=9o77QEeM-68

2. Complete the Full Summer Review. Show all work.

You will have a pre-test on MYP content and content on this assignment (including knowing polyatomic ions)

3. Remember: This is a big packet to make sure that you are prepared for DP chem. Do not wait until the last minute to complete the packet. I will be available to answer any questions the first week of school but you should be able to do most of it on your own as all this content was covered in MYP.

Name	Formula	Name	Formula
Acetate	$C_2H_3O_2^-$	Hypochlorite	ClO^-
Carbonate	CO_3^{2-}	Chlorite	ClO_2^-
Hydrogen carbonate (or bicarbonate)	HCO_3^-	Chlorate	ClO_3^-
Hydroxide	OH^-	Perchlorate	ClO_4^-
Nitrite	NO_2^-	Permanganate	MnO_4^-
Nitrate	NO_3^-	Sulfite	SO_3^{2-}
Chromate	CrO_4^{2-}	Hydrogen sulfite (or bisulfite)	HSO_3^-
Dichromate	$Cr_2O_7^{2-}$	Sulfate	SO_4^{2-}
Phosphate	PO_4^{3-}	Hydrogen sulfate (or bisulfate)	HSO_4^-
Hydrogen phosphate	HPO_4^{2-}	Cyanide	CN^-
Dihydrogen phosphate	$H_2PO_4^-$	Peroxide	O_2^{2-}
Ammonium	NH_4^+	Thiocyanate	SCN^-

NO_3^-	***nitrate***	SO_4^{2-}	s***ulfate***	PO_4^{3-}	***phosphate***
NO_2^-	***nitrite***	SO_3^{2-}	***sulfite***	PO_3^{3-}	***phosphite***
ClO^-	*hypo*chlor*ite*	BrO^-	*hypo*brom*ite*	IO^-	*hypo*iod*ite*
ClO_2^-	chlor*ite*	BrO_2^-	brom*ite*	IO_2^-	iod*ite*
ClO_3^-	chlor*ate*	BrO_3^-	brom*ate*	IO_3^-	iod*ate*
ClO_4^-	*per*chlor*ate*	BrO_4^-	*per*brom*ate*	IO_4^-	*per*iod*ate*

6. The periodic table

Atomic number
Element
Relative atomic mass

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	1 **H** 1.01																	2 **He** 4.00
2	3 **Li** 6.94	4 **Be** 9.01											5 **B** 10.81	6 **C** 12.01	7 **N** 14.01	8 **O** 16.00	9 **F** 19.00	10 **Ne** 20.18
3	11 **Na** 22.99	12 **Mg** 24.31											13 **Al** 26.98	14 **Si** 28.09	15 **P** 30.97	16 **S** 32.07	17 **Cl** 35.45	18 **Ar** 39.95
4	19 **K** 39.10	20 **Ca** 40.08	21 **Sc** 44.96	22 **Ti** 47.87	23 **V** 50.94	24 **Cr** 52.00	25 **Mn** 54.94	26 **Fe** 55.85	27 **Co** 58.93	28 **Ni** 58.69	29 **Cu** 63.55	30 **Zn** 65.38	31 **Ga** 69.72	32 **Ge** 72.63	33 **As** 74.92	34 **Se** 78.96	35 **Br** 79.90	36 **Kr** 83.90
5	37 **Rb** 85.47	38 **Sr** 87.62	39 **Y** 88.91	40 **Zr** 91.22	41 **Nb** 92.91	42 **Mo** 95.96	43 **Tc** (98)	44 **Ru** 101.07	45 **Rh** 102.91	46 **Pd** 106.42	47 **Ag** 107.87	48 **Cd** 112.41	49 **In** 114.82	50 **Sn** 118.71	51 **Sb** 121.76	52 **Te** 127.60	53 **I** 126.90	54 **Xe** 131.29
6	55 **Cs** 132.91	56 **Ba** 137.33	57 † **La** 138.91	72 **Hf** 178.49	73 **Ta** 180.95	74 **W** 183.84	75 **Re** 186.21	76 **Os** 190.23	77 **Ir** 192.22	78 **Pt** 195.08	79 **Au** 196.97	80 **Hg** 200.59	81 **Tl** 204.38	82 **Pb** 207.20	83 **Bi** 208.98	84 **Po** (209)	85 **At** (210)	86 **Rn** (222)
7	87 **Fr** (223)	88 **Ra** (226)	89 ‡ **Ac** (227)	104 **Rf** (267)	105 **Db** (268)	106 **Sg** (269)	107 **Bh** (270)	108 **Hs** (269)	109 **Mt** (278)	110 **Ds** (281)	111 **Rg** (281)	112 **Cn** (285)	113 **Uut** (286)	114 **Uuq** (289)	115 **Uup** (288)	116 **Uuh** (293)	117 **Uus** (294)	118 **Uuo** (294)

†	58 **Ce** 140.12	59 **Pr** 140.91	60 **Nd** 144.24	61 **Pm** (145)	62 **Sm** 150.36	63 **Eu** 151.96	64 **Gd** 157.25	65 **Tb** 158.93	66 **Dy** 162.50	67 **Ho** 164.93	68 **Er** 167.26	69 **Tm** 168.93	70 **Yb** 173.05	71 **Lu** 174.97
‡	90 **Th** 232.04	91 **Pa** 231.04	92 **U** 238.03	93 **Np** (237)	94 **Pu** (244)	95 **Am** (243)	96 **Cm** (247)	97 **Bk** (247)	98 **Cf** (251)	99 **Es** (252)	100 **Fm** (257)	101 **Md** (258)	102 **No** (259)	103 **Lr** (262)

Significant Figures in Measurement and Calculations

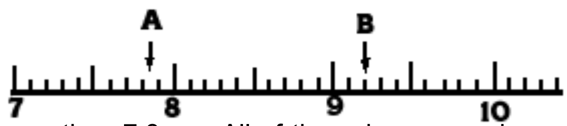
A successful chemistry student habitually labels all numbers, because the unit is important. Also of great importance is the number itself. Any number used in a calculation should contain only figures that are considered reliable; otherwise, time and effort are wasted. Figures that are considered reliable are called significant figures. Chemical calculations involve numbers representing actual measurements. In a measurement, significant figures in a number consist of:

Figures (digits) definitely known + One estimated figure (digit)

In class you will hear this expressed as "all of the digits known for certain plus one that is a guess."

Recording Measurements

When one reads an instrument (ruler, thermometer, graduate, buret, barometer, balance), he expresses the reading as one which is reasonably reliable. For example, in the accompanying illustration, note the reading marked A. This reading is definitely beyond the 7 cm mark and also beyond the 0.8 cm mark. We read the 7.8 with certainty. We further estimate that the reading is five-tenths the distance from the 7.8 mark to the 7.9 mark. So, we estimate the length as 0.05 cm more than 7.8 cm. All of these have meaning and are therefore significant. We express the reading as 7.85 cm, accurate to three significant figures. All of these figures, 7.85, can be used in calculations. In reading B we see that 9.2 cm is definitely known. We can include one estimated digit in our reading, and we estimate the next digit to be zero. Our reading is reported as 9.20 cm. It is accurate to three significant figures.



Rules for Zeros

If a zero represents a measured quantity, it is a significant figure. If it merely locates the decimal point, it is not a significant figure.

Zero Within a Number. In reading the measurement 9.04 cm, the zero represents a measured quantity, just as 9 and 4, and is, therefore, a significant number. A zero between any of the other digits in a number is a significant figure.

Zero at the Front of a Number. In reading the measurement 0.46 cm, the zero does not represent a measured quantity, but merely locates the decimal point. It is not a significant figure. Also, in the measurement 0.07 kg, the zeros are used merely to locate the decimal point and are, therefore, not significant. Zeros at the first (left) of a number are not significant figures.

Zero at the End of a Number. In reading the measurement 11.30 cm, the zero is an estimate and represents a measured quantity. It is therefore significant. Another way to look at this: The zero is not needed as a placeholder, and yet it was included by the person recording the measurement. It must have been recorded as a part of the measurement, making it significant. Zeros to the right of the decimal point, and at the end of the number, are significant figures.

Zeros at the End of a Whole Number. Zeros at the end of a whole number may or may not be significant. If a distance is reported as 1600 feet, one assumes two sig figs. Reporting measurements in scientific notation removes all doubt, since all numbers written in scientific notation are considered significant.

significant.	1 600 feet	1.6×10^3 feet	Two significant figures
	1 600 feet	1.60×10^3 feet	Three significant figures
	1 600 feet	1.600×10^3 feet	Four significant figures

Sample Problem #1: Underline the significant figures in the following numbers.

(a) 0.0420 cm	answer = 0.0420 cm	(e) 2 403 ft.	answer = 2403 ft.
(b) 5.320 in.	answer = 5.320 in.	(f) 80.5300 m	answer = 80.5300 m
(c) 10 lb.	answer = 10 lb.	(g) 200. g	answer = 200 g
(d) 0.020 ml	answer = 0.020 ml	(h) 2.4×10^3 kg	answer = 2.4×10^3 kg

Rounding Off Numbers

In reporting a numerical answer, one needs to know how to "round off" a number to include the correct number of significant figures. Even in a series of operations leading to the final answer, one must "round off" numbers. The rules are well accepted rules:

1. If the figure to be dropped is less than 5, simply eliminate it.
2. If the figure to be dropped is greater than 5, eliminate it and raise the preceding figure by 1.
3. If the figure is 5, followed by nonzero digits, raise the preceding figure by 1
4. If the figure is 5, not followed by nonzero digit(s), and preceded by an odd digit, raise the preceding digit by one
5. If the figure is 5, not followed by nonzero digit(s), and the preceding significant digit is even, the preceding digit remains unchanged

Sample Problem #2: Round off the following to three significant figures.

(a) 3.478 m	answer = 3.48 m	(c) 5.333 g	answer = 5.33 g
(b) 4.8055 cm	answer = 4.81 cm	(d) 7.999 in.	answer = 8.00 in.

Multiplication

In multiplying two numbers, when you wish to determine the number of significant figures you should have in your answer (the product), you should inspect the numbers multiplied and find which has the least number of significant figures. This is the number of significant figures you should have in your answer (the product). Thus the answer to 0.024 x 1244 would be rounded off to contain two significant figures since the factor with the lesser number of significant figures (0.024) has only two such figures.

Sample Problem #3: Find the area of a rectangle 2.1 cm by 3.24 cm.

Solution: Area = 2.1 cm x 3.24 cm = 6.804 cm^2

We note that 2.1 contains two significant figures, while 3.24 contains three significant figures. Our product should contain no more than two significant figures. Therefore, our answer would be recorded as 6.8 cm^2

Sample Problem #4: Find the volume of a rectangular solid 10.2 cm x 8.24 cm x 1.8 cm

Solution: Volume = 10.2 cm x 8.24 cm x 1.8 cm = 151.2864 cm^3

We observe that the factor having the least number of significant figures is 1.8 cm. It contains two significant figures. Therefore, the answer is rounded off to 150 cm^3.

Division

In dividing two numbers, the answer (quotient) should contain the same number of significant figures as are contained in the number (divisor or dividend) with the least number of significant figures. Thus the answer to 528 $\frac{4}{2}$ 0.14 would be rounded off to contain two significant figures. The answer to 0.340 ÷ 3242 would be rounded off to contain three significant figures.

Sample Problem #5: Calculate 20.45 ÷ 2.4

Solution: 20.45 ÷ 2.4 = 8.52083

We note that the 2.4 has fewer significant figures than the 20.45. It has only two significant figures. Therefore, our answer should have no more than two significant figures and should be reported as 8.5.

Addition and Subtraction

In adding (or subtracting), set down the numbers, being sure to keep like decimal places under each other, and add (or subtract). Next, note which column contains the first estimated figure. This column determines the last decimal place of the answer. After the answer is obtained, it should be rounded off in this column. In other words, round to the least number of decimal places in you data.

Sample Problem #6: Add 42.56 g + 39.460 g + 4.1g

Solution:

42.56 g
39.460 g
4.1g

Sum = 86.120 g

Since the number 4.1 only extends to the first decimal place, the answer must be rounded to the first decimal place, yielding the answer 86.1 g.

Average Readings

The average of a number of successive readings will have the same number of decimal places that are in their sum.

Sample Problem #7: A graduated cylinder was weighed three times and the recorded weighings were 12.523 g, 12.497 g, 12.515 g. Calculate the average weight.

Solution:

12.523 g
12.497 g
12.515g
37.535 g

In order to find the average, the sum is divided by 3 to give an answer of 12.51167. Since each number extends to three decimal places, the final answer is rounded to three decimal places, yielding a final answer of 12.512 g. Notice that the divisor of 3 does not affect the rounding of the final answer. This is because 3 is an exact number - known to an infinite number of decimal places.

SCIENTIFIC NOTATION, SIG. FIGS., DENSITY

1.Change to scientific notation.

a. $5.420 \text{ X } 10^{3}$ =______________________ d. $0.0067 \text{ x } 10^{-4}$ = ______________________

b. $0.020 \text{ x } 10^{3}$ =______________________ e. $-870 \text{ x } 10^{-4}$ = ______________________

c. $0.00492 \text{ x} 10^{12}$ =______________________ f. $-602 \text{ x } 10^{21}$ = ______________________

2. Determine the number of sig. figs. in the following:

a. 0.002030 =____________s.f. e. 670 =____________s.f.

b. 670.0 =____________s.f. f. 1.35000 =____________s.f.

c. $4 \text{ x } 10^{2}$ =____________s.f. g. $4.00 \text{ x } 10^{2}$ =____________s.f.

d. 4640 =____________s.f. h. $0.060 \text{x} 10^{3}$ = s.f

3. Perform the following calculations. Report your answer in correct number of sig.figs. and units.

a. 1.008 m + 32.00 m + 2.2 m = ____________________

b. 17.65 g – 9.7 g = ____________

c. $2.03 \text{ cm}^{2} \div 1.2 \text{ cm}$ = ____________

d. 13.8612 cm x 2.02 cm =____________

4. Givethe number ofsignificant figures in each of thefollowing:

_____ 402 m _____34.20 lbs _____0.03 sec

_____ 0.00420 g _____3 200 liters _____0.0300 ft.

______ $5.1 \text{ x } 10^{4}$ kg _____ 0.48 m _____1 400.0 m

_____ 78 323.01 g _____ 1.10 torr _____760 mm Hg

(5)a Multiply each of the following, observing sig fig rules

17 m x 324 m = ____________________ 1.7 mm x 4 294 mm = ______________________

0.005 in x 8 888 in = ________________ 0.050 m x 102 m = _________________________

0.424 in x .090 in = _________________ 324 000 cm x 12.00 cm = ____________________

5b. Divide each of the following, observing sig figs rules

23.4 m ÷ 0.50 sec = ________________ 12 miles ÷ 3.20 hours = ___________________

0.960 g ÷1.51 moles = ________________ 1 200 m ÷ 12.12 sec = ______________________

6. Add each of the following, observing significant figures rules:

3.40 m	102.45 g	102. cm
+0.022 m	+2.44 g	+3.14 cm
0.5 m	1.9999g	5.9 cm

7. Subtract each of the following, observing significant figure rules:

42.306 m	14.33 g	234.1 cm
-1.22 m	-3.468g	-62.04cm

8. Work each of the following problems, observing sig fig rules

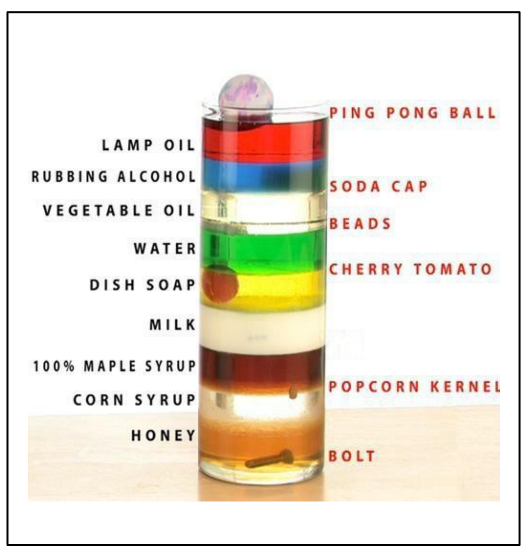
a) Three determinations were made of the percentage of oxygen in mercuric oxide. The results were 7.40%, 7.43%, and 7.35%. What was the average percentage?

b) A rectangular solid measures 13.4 cm x 11.0 cm x 2.2 cm. Calculate the volume of the solid.

c) If the density of mercury is 13.6 g/ml, what is the mass in grams of 3426 ml of the liquid?

d) A copper cylinder, 12.0 cm in radius, is 44.0 cm long. If the density of copper is 8.90 g/cm^3, calculate the mass in grams of the cylinder. (assume pi = 3.14)

9. Write at least 7 facts describing/explaining the Chemistry behind the picture on the right.



10. A 12.00 g unknown substance is placed in a container with 50.0 mL water. The water level rose up to 55.2 mL. Calculate the density of the substance.

11. Draw/illustrate how the following substances will appear inside a graduated cylinder just like in question # 9.

Liquid 1 (0.69 g/mL)	Solid 1 (0.8 g/mL)
Liquid 2 (1.26 g/mL)	Solid 2 (2.04 g/mL)
Liquid 3 (water)	Liquid 4 (3.05 g/mL)

FORMULA WRITING, NAMING OF COMPOUNDS & BALANCING CHEMICAL EQUATIONS

(Refer to the Periodic Table included in this packet as well as the list of polyatomic ions)

12 . Name the following ionic compounds:

a. $LiCl$ –
b. $Mg(OH)_2$ –
c. K_3P –
d. Fe_2O_3 –
e. FeO –
f. $ZnCl_2$ –
g. $AgNO_3$ –
h. NH_4Cl –
i. $CuCl_2$ –
j. $SnCl_2$ –
k. PbO_2 –
l. $AlCl_3$ –
m. PbSO4 –
n. $Mg_3(PO_3)_2$ –
o. Na_2CO_3 –
p. $NaHCO_3$ –

13. Write ionic formulas for the following compounds:

a. sodium acetate –
b. tin(II) chloride -
c. calcium hydroxide -
d. zinc sulfite -
e. ammonium sulfate -
f. manganese(II) hypochlorite –
g. copper (I) nitrite -
h. silver cyanide -
i. sodium chloride –
j. lithium fluoride -
k. potassium sulfide –
l. aluminum oxide -
m. nickel (II) chlorite –
n. lead (II) nitrate
o. ammonium sulfate -
p. aluminum perchlorate -

q. KCN –
r. $KMnO_4$-
s. FeC_2O_4 –
t. $Al(ClO)_3$ –
u. FeS_2O_3 –
v. $Sn(CrO_4)_2$ –
w. $Mg(HSO_4)_2$ –

q. iron (II) dichromate –
r. lead (IV) bromite -
s. lead (II) periodate -
t. magnesium thiocyanate –
u. calcium thiosulfate -
v. sodium bicarbonate –
w. strontium hydroxide -

14. Name the following covalent compounds:

a. CO –
b. CO_2 –
c. H_2O –
d. CCl_4 –
e. N_2O_3 –
f. SiO_2 –
g. N_2O –
h. CBr_4 –
i. SO_2 –
j. S_2Cl_2 –
k. P_2O_7 –

15. Write the molecular formula for the following compounds:

a. xenon hexafluoride -
b. tetranitrogen tetraoxide-
c. boron trifluoride -
d. carbon tetrabromide –
e. dicarbon tetrafluoride –
f. nitrogen tribromide -
g. dinitrogen tetrasulfide –
h. oxygen difluoride -
i. dinitrogen pentoxide -
j. tetraphosphorus decoxide –
k. sulfur hexafluoride -

16. Translate the following word equations to a balanced chemical equations.

a. Iron (II) oxide + aluminum à iron + aluminum oxide

b. Hydrochloric acid + sodium hydroxide à water + sodium chloride

c. Calcium phosphate + sulfuric acid à calcium sulfate + phosphoric acid

d. calcium carbonate → calcium + carbon + oxygen gas

e. sodium chloride + silver nitrate → sodium nitrate + silver chloride

f. potassium hydroxide _+ sulfuric acid → potassium sulfate + water

17 . Identify the type of equation for each of the equations you balanced in #16

MOLES ↔ GRAMS, MOLARITY, AND STOICHIOMETRY

a. Use the Periodic Table included in this packet for the atomic masses. Do not round the atomic masses.
b. Show cancellation of units and report the final answer with the correct unit and correct number of sig figs.
c. Molarity is a measurement of concentration. M = mol/L. If the concentration of a substance is 1.5 M, it means that 1.5 mol = 1 L.

18. Convert the following to moles :

a. 36.85 g C = ______________

b. 170 g O_2 = ____________

c. 24.0 g Cu = _______________

d. 165.02 g H_2O = ________________

e. 320.0 g $CaCO_3$ = ________________

f. 50.020 g $Ca_3(PO_4)_2$ = ________________

19. Convert the following to grams:

a. 1.20 mol H_2 = _______________

b. 0.052 mol Ca = _______________

c. 10.0 mol CO_2 = ______________

d. 0.00650 mol $AgNO_3$ = ________________

e. 1.025 mole $Al_2(SO_4)_3$ = ________________

20. Find the concentration for each of the following

Concentration $= M = \frac{mol}{L}$

a. 25.0 g HCl in 2.1 L solution

b. 42.2 g KOH in 250 mL solution

c. 0.065 kg $Ba(OH)_2$ in 350 mL solution

21. Find the number of moles of solute present in the following solutions:

a. 1.20 L of 0.25M H2SO4 solution

b. 0.520 L of 1.2M CuSO4 solution

c. 650.0 mL of 0.21M KNO3 solution

22. Solve the following stoichiometric problems completely.

a. Air bags in cars operate according to the reaction:

$$\_\_ Na_3N(s) \rightarrow \_\_ Na(s) + \_\_ N_2(g)$$

How many grams of nitrogen gas are produced during the decomposition of 3.25 g Na_3N ?

b. How many grams of lithium are needed to produce 45.0 g of lithium nitride, according to the following process?

$$\_\_\ Li(s) + \_\ N_2(g) \rightarrow \_Li_3N(s)$$

c. A 24.5g sample of sodium chloride reacts with 41.3 g of fluorine gas according to the following chemical equation:

$$\_NaCl(s) + \_\ F_2(g) \rightarrow \_\ NaF(s) + \_Cl_2(g)$$

i. Which is the limiting reactant? Justify your answer with calculations.

ii. How many grams of chlorine gas are produced?

iii. How much excess is left over?

d. An 84.1 gram sample of phosphorus reacts with 85.0 g of oxygen according to the following equation:

$$\_\ P(s) + \_O_2(g) \rightarrow \_\ P_2O_5(s)$$

i. Find the limiting reactant. Justify your answer with calculations.

ii. How many grams of P_2O_5 are produced in theory? (based on calculation)

iii. A student performed the reaction in the lab and found out that only 123 g of P_2O_5 were produced. What then is the percent yield for P_2O_5 ?

GAS LAWS

23. Write down what the following gas laws state and their respective equations.

a. Boyle's Law : ____________________
Equation :

b. Charles' Law : ____________________
Equation :

c. Gay-Lussac's Law : ____________________
Equation :

d. Combined Gas Law : ____________________
Equation :

e. Avogadro's Law : ____________________
Equation :

f. Ideal Gas Law : ____________________
Equation :

24. A 100.0 L sample of gas was compressed to 10.0 mL where its pressure is 350.0 torr. What was the original pressure (in torr) of the 100.0 L sample?

25. Butane gas is stored in a tank at a pressure of 10.0 atm at 22.0°C. The tank can hold a pressure of 50.0 atm before bursting. During a fire the gas is heated to 500.0°C. What is the gas pressure, and will the tank contain the gas without bursting?

26. Calculate the volume in liters of 38.8 g of CO_2 at 725 torr and 25.0°C

27. A gas occupies 450.0 mL at 655 mm Hg pressure and 30.0°C. What will its volume be at STP?

28. On hot days, you may have noticed that potato chip bags seem to "inflate", even though they have not been opened. If I have a 250.0 mL bag at a temperature of 19.0^{O}C, and I leave it in my car which has a temperature of 60.0^{O}C, what will the new volume of the bag be?

General problems

29. How many grams of Na_2CO_3 (molar mass = 106.0 g/mol) are required for complete reaction with 25.0 mL of 0.155 M HNO_3? (*hint:* M = mol/L; so 0.155 M is equal to 0.155 mol HNO_3 = 1 L HNO_3)

$Na_2CO_3 + 2HNO_3 \rightarrow 2NaNO_3 + CO_2 + H_2O$

30. At STP, it was found that 1.12 L of a gas had a mass of 2.78 g. What is it's molar mass?

31. A sample of gas occupies 30.0 L at 0.800 atm and 298 K. How many moles of gas are in the sample?

32. What volume of 0.150 M NaOH is needed to react completely with 3.45 g iodine according to the equation:

$3\ I_2 + 6\ NaOH \rightarrow 5\ NaI + NaIO_3 + 3\ H_2O$

33. 1.056 g of metal carbonate, containing an unknown metal, M, were heated to give the metal oxide and 0.376 g CO_2.

$$MCO_3(s) + heat \rightarrow MO(s) + CO_2(g)$$

What is the identity of the metal M? (show all work)

a) Mg
b) Cu
c) Zn
d) Ba

34. The reaction of 25.0 g benzene, C_6H_6, with excess HNO_3 resulted in 21.4 g $C_6H_5NO_2$. What is the percentage yield?

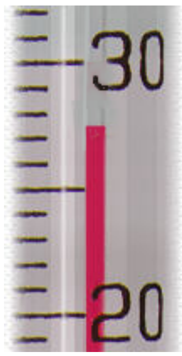
$$C_6H_6 + HNO_3 \rightarrow C_6H_5NO_2 + H_2O$$

35. A 100.0-g sample of a compound is made up of 35.9 g of aluminum and 64.1 g of sulfur. The empirical of the compounds is:

36. An organic compound which has the empirical formula CHO has a molar mass of 232. Determine the molecular formula

37.

How many significant digits are present in the temperature read from the thermometer illustrated to the right?



a) 1 b) 2 c) 3 d) 4

38. Convert

a) 23.6 cm to km

b) 356 mg to g

c) 0.00968 nL to hL

d) 0.00023480 ks to cs

e) 0.000589 nm to m

39. A metal sample weighing 30.9232 grams was added to a graduated cylinder containing 23.26 mL of water. The volume of water plus the sample was 24.85 mL. Which setup will result in the density of this metal?

a) 30.9232 x (24.85-23.26)

b) $\frac{30.9232}{24.85 - 23.26}$

c) $\frac{24.85 - 23.26}{30.9232}$

d) 30.9232 x $\frac{24.85}{23.26}$

e) $\frac{30.9232}{24.85 + 23.26}$

40. Which of the following is an isotope of the element with 20 protons (p=20) and 22 neutrons (n=22)?

a) titanium-22

b) zirconium-40

c) calcium-40

d) titanium-48

Name ______________________

Date ___ ______________________

Safety Quiz

Fill in the blank.

1. Pour chemicals from large reagent bottles into ____________________ ____________________ before measuring.
2. Read and ____________________ a chemical label before using the chemical.
3. When diluting an acid, always add ____________________ to ____________________.
4. Work with volatile chemicals under a ____________________ ____________________.
5. Use a ____________________ or ____________________ to draw liquid into a pipette.
6. Strike matches ____________________ ____________________ your body.
7. Move test tubes back and forth at an ____________________ while heating.
8. Hold hot glassware with ____________________ or ____________________ ____________________.
9. When inserting lubricated glass tubing into a stopper, protect your hands with ____________________ ____________________.
10. Always protect your eyes with ____________________ ____________________ when working in the laboratory.
11. Stand on a ____________________ ____________________ if you need to reach.
12. Rinse chemicals from your eyes in an ____________________ ____________________.
13. ____________________ clothing on the way to the safety shower.
14. Extinguish small fires in containers by ____________________ them.
15. Put out clothing fires in a ____________________ ____________________.

Safety Quiz

True or False

_____ 1. Hold bottles with your hand over the label while pouring.

_____ 2. Immediately wipe up any spills.

_____ 3. When lighting a Bunsen burner, first turn on the gas, then strike your match.

_____ 4. Check glassware for stars and cracks.

_____ 5. Shake laboratory thermometers down before use.

_____ 6. Carefully scoop up mercury from a broken thermometer with a piece of paper.

_____ 7. If you don't have an inserter, lubricate glass tubing before inserting it through a stopper.

_____ 8. Balance a centrifuge by placing test tubes containing equal masses opposite each other.

_____ 9. Wear closed leather shoes to protect your feet.

_____ 10. Remove rings and watches before working in the laboratory.

Name: ____ Block: _________ Due date: _________

Laboratory Glassware

Name of equipment	**Picture**	**Function (Mark an x to all that apply)**								**Measurement Unit (if applicable. i.e. mL, g, s)**
		Mix	Deliver	Measure	Contain	Deliver	Crush	Heat	Other (Explain)	
Beaker										
Thermometer										
Erlenmeyer flask										
Graduated cylinder										
Bunsen burner										
Test tube										
Balance scale										

Name of equipment	**Picture**	**Function (Mark an x to all that apply)**								**Measurement Unit (if applicable. i.e. mL, g, s)**
		Mix	Deliver	Measure	Contain	Deliver	Crush	Heat	Other (Explain)	
Burette (buret)										
Scoopula										
Plastic pipette										
Graduated pipette										
Volumetric flask										
Watchglass										
Mortar and pestle										
Funnel										