

## The Periodic Table

<i>IA</i> <b>H</b> 1 1.01																	<i>VIIIA</i> <b>He</b> 2 4.00		
<i>IIA</i> <b>Li</b> 3 6.94	<b>Be</b> 4 9.01											<i>IIIA</i> <b>B</b> 5 10.81	<i>IVA</i> <b>C</b> 6 12.01	<i>V</i> <b>N</b> 7 14.01	<i>VIA</i> <b>O</b> 8 16.00	<i>VIIA</i> <b>F</b> 9 19.00	<b>Ne</b> 10 20.18		
<b>Na</b> 11 22.99	<b>Mg</b> 12 24.31			<i>IIIB</i> <b>Sc</b> 21 44.96	<i>IVB</i> <b>Ti</b> 22 47.88	<i>VB</i> <b>V</b> 23 50.94	<i>VIB</i> <b>Cr</b> 24 52.00	<i>VII</i> <b>Mn</b> 25 54.94	<i>VIII</i> <b>Fe</b> 26 55.85	<i>VIII</i> <b>Co</b> 27 58.93	<i>VIII</i> <b>Ni</b> 28 58.69	<i>IB</i> <b>Cu</b> 29 63.55	<i>IIB</i> <b>Zn</b> 30 65.39	<i>IIIA</i> <b>Ga</b> 31 69.72	<i>IVA</i> <b>Ge</b> 32 72.61	<i>V</i> <b>As</b> 33 74.92	<i>VIA</i> <b>Se</b> 34 78.96	<i>VIIA</i> <b>Br</b> 35 79.90	<b>Kr</b> 36 83.80
<b>Rb</b> 37 85.47	<b>Sr</b> 38 87.62	<b>Y</b> 39 88.91	<b>Zr</b> 40 91.22	<b>Nb</b> 41 92.91	<b>Mo</b> 42 95.94	<b>Tc</b> 43 (97.9)	<b>Ru</b> 44 101.07	<b>Rh</b> 45 102.91	<b>Pd</b> 46 106.42	<b>Ag</b> 47 107.87	<b>Cd</b> 48 112.41	<b>In</b> 49 114.82	<b>Sn</b> 50 118.71	<b>Sb</b> 51 121.76	<b>Te</b> 52 127.60	<b>I</b> 53 126.90	<b>Xe</b> 54 131.29		
<b>Cs</b> 55 132.91	<b>Ba</b> 56 137.33	<b>La</b> 57 138.91	<b>Hf</b> 72 178.49	<b>Ta</b> 73 180.95	<b>W</b> 74 183.85	<b>Re</b> 75 186.21	<b>Os</b> 76 190.2	<b>Ir</b> 77 192.22	<b>Pt</b> 78 195.08	<b>Au</b> 79 197.97	<b>Hg</b> 80 200.59	<b>Tl</b> 81 204.38	<b>Pb</b> 82 207.2	<b>Bi</b> 83 208.98	<b>Po</b> 84 (209)	<b>At</b> 85 (210)	<b>Rn</b> 86 (222)		
<b>Fr</b> 87 223.02	<b>Ra</b> 88 226.03	<b>Ac</b> 89 227.03	<b>Rf</b> 104 (261)	<b>Db</b> 105 (262)	<b>Sg</b> 106 263	<b>Bh</b> 107 (262)	<b>Hs</b> 108 (265)	<b>Mt</b> 109 (266)	<b>Ds</b> 110 (271)	<b>Rg</b> 111 (272)	<b>Uub</b> 112 (285)	<b>Uut</b> 113 (284)	<b>Uuq</b> 114 (289)	<b>Uup</b> 115 (288)					
<b>Ce</b> 58 140.12	<b>Pr</b> 59 140.91	<b>Nd</b> 60 144.24	<b>Pm</b> 61 (145)	<b>Sm</b> 62 150.36	<b>Eu</b> 63 152.97	<b>Gd</b> 64 157.25	<b>Tb</b> 65 158.93	<b>Dy</b> 66 162.50	<b>Ho</b> 67 164.93	<b>Er</b> 68 167.26	<b>Tm</b> 69 168.93	<b>Yb</b> 70 173.04	<b>Lu</b> 71 174.97						
<b>Th</b> 90 232.04	<b>Pa</b> 91 231.04	<b>U</b> 92 238.03	<b>Np</b> 93 237.05	<b>Pu</b> 94 (240)	<b>Am</b> 95 243.06	<b>Cm</b> 96 (247)	<b>Bk</b> 97 (248)	<b>Cf</b> 98 (251)	<b>Es</b> 99 252.08	<b>Fm</b> 100 257.10	<b>Md</b> 101 (257)	<b>No</b> 102 259.10	<b>Lr</b> 103 262.11						

## Some Formula and Constants:

$$\begin{aligned}
 c &= 2.998 \times 10^8 \text{ m}\cdot\text{s}^{-1} \\
 h &= 6.626 \times 10^{-34} \text{ J}\cdot\text{s} \\
 N &= 6.023 \times 10^{23} \text{ mol}^{-1} \\
 1 \text{ nm} &= 1 \times 10^{-9} \text{ m} \\
 1 \text{ L} &= 1 \times 10^3 \text{ mL} \\
 1 \text{ kHz} &= 1 \times 10^3 \text{ Hz}
 \end{aligned}$$



SID 

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Last \_\_\_\_\_

First \_\_\_\_\_

Question 1  
3 Points

If a **115 g** sample of the liquid chlorodibromomethane has a volume of **47.0 mL**, what is the **density** of the compound in **g/mL**?

 g/mLQuestion 2  
7 Points

- a. When **32.979** is **added** to **85.71**, the result should be reported with \_\_\_\_\_ digit(s) after the decimal point.
- b. When **11.788** and **37.09** are **multiplied**, the answer should be reported to \_\_\_\_\_ significant digit(s).
- c. Identify the number of significant figures in the following numbers.

19.5400 \_\_\_\_\_

0.0095 \_\_\_\_\_

1030 \_\_\_\_\_

Question 3  
4 Points

How much will a student earn in **13 weeks** if she works for **11 hours each week** at a rate of **\$9.00 / hour**?

**No need to do the calculation** - just set up the correct dimensional analysis conversions - you may not need to fill in all the boxes.

13 weeks x \_\_\_\_\_ x \_\_\_\_\_ x \_\_\_\_\_

Question 4  
4 Points

The liquid ethyl acetate has a density of **0.900 g/mL** at **20 °C**. If a sample of this liquid at **20 °C** has a volume of **1.90 L**, how many **grams** of liquid are there in the sample?

Must show work using Dimensional Analysis

 gQuestion 5  
6 Points

How many protons, neutrons and electrons are there in  ${}^{65}_{29}\text{Cu}^+$

Protons: \_\_\_\_\_

Neutrons: \_\_\_\_\_

Electrons: \_\_\_\_\_

Question 6  
6 Points

The element **gallium** has an atomic weight of **69.7 amu** and consists of two stable isotopes. **Ga-69** has an atomic mass of **68.9 amu** and a percent natural abundance of **60.4%**. **Ga-71** has a percent natural abundance of **39.6%**. What is the **atomic mass** of **Ga-71**?

 amu

Question 7  
10 Points

Use the Periodic Table accompanying this exam to answer the following questions:

1. Al is in **period** \_\_\_\_\_ and **group** \_\_\_\_\_.
2. The **symbol** for the lightest **alkaline earth metal**. \_\_\_\_\_
3. Element **59** is a(n) \_\_\_\_\_
4. Group **VIIA** are collectively **known** as the: \_\_\_\_\_
5. **Circle** those (if any) of the following that are **Main Group elements**

V                      Ni                      In                      Be                      U

Question 8  
8 Points

Give the correct **name** for each of the following ionic compounds.

- a.  $Mg(NO_2)_2$  \_\_\_\_\_ c.  $Fe_2(SO_4)_3$  \_\_\_\_\_  
b.  $NH_4Br$  \_\_\_\_\_ d.  $Mg_3N_2$  \_\_\_\_\_

Question 9  
8 Points

Give the correct **formula** for each of the following ionic compounds.

- a. Sodium nitride \_\_\_\_\_  
b. Potassium sulfite \_\_\_\_\_  
c. Iron(II) chlorate \_\_\_\_\_  
d. Potassium dichromate \_\_\_\_\_

Question 10  
3 Points

Assuming that the distance between the atoms that form the following salts are the same order them in increasing Force of Attraction?

Calcium sulfide                      Potassium chloride                      Aluminum phosphide  
\_\_\_\_\_  
Smallest Force of Attraction                      Largest Force of Attraction

Question 11  
4 Points

How many **atoms** of **sulfur** are present in **4.37 moles** of  $S_2F_{10}$ ?

Show Work

Question 12  
4 Points

How many **moles** of fluorine are present in  $1.73 \times 10^{22}$  **molecules** of  $O_2F_2$ ?

Show Work

\_\_\_\_\_ atoms of S

\_\_\_\_\_ mol F

Question 13  
6 Points

A compound is found to contain **30.45 % nitrogen** and **69.55 % oxygen** by weight and a molecular weight of **92.02 g/mol**. What is the **formula** of this compound?

Show Work

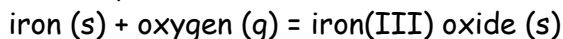
Question 14  
6 Points

When the following molecular equations are balanced using the **smallest possible integer coefficients**, the values of these coefficients are:



Question 15  
4 Points

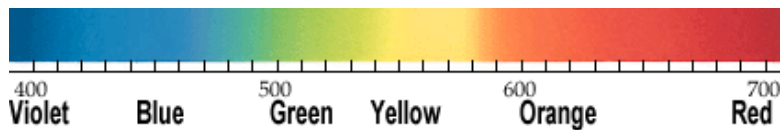
An iron nail rusts when exposed to oxygen. According to the following reaction, how many **moles of oxygen** gas are necessary to form **0.632 moles iron(III) oxide**?



mol oxygen gas

Question 16

6 Points



a) Put the following forms of visible light in order of **increasing frequency**

- Violet
  - Yellow
  - Green
1. Lowest Frequency
  2. Second Highest Frequency
  3. Highest Frequency

b) Put the following forms of visible light in order of **increasing energy**:

- Green
  - Blue
  - Orange
1. Smallest Energy
  2. Second Highest Energy
  3. Highest Energy

Question 17

4 Points

A local AM radio station broadcasts at a frequency of **565 kHz**. Calculate the wavelength in **meters** at which it is broadcasting. Show Work

m

Question 18

7 Points

The wavelength of a particular color of red light is **672 nm**. What is the **energy** of this light in **J.mol<sup>-1</sup>**? Show Work

J.mol<sup>-1</sup>

*Do Not Write Below This*

**Exam I Score**