

Study Guide –Chapter 4

CHM1033. Summer 2020

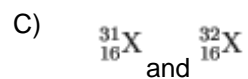
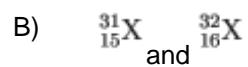
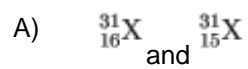
Test # 2: Jun. 17th (Chapters: 3 and 4)

1. Give the name of the following elements, classify in metals (M) , nonmetals (NM) or metalloids (MO).

	Name	M, NM, or MO?		Name	M, NM, or MO?
	H			Si	
	Li			Ge	
	Na			Sn	
	K			Pb	
	Rb			N	
	Cs			P	
	Be			As	
	Mg			O	
	Ca			S	
	Sr			Se	
	Ba			Te	
	Sc			F	
	Ti			Cl	
	V			Br	
	Cr			I	
	Mn			He	
	Fe			Ne	

Co			Ar		
Ni			Kr		
Cu			Ag		
Zn			Au		
B			Cd		
Al			Hg		
Ga			Bi		
C			Po		

2. Which two of the following are isotopes of the same element: ${}_{16}^{31}\text{X}$, ${}_{15}^{31}\text{X}$, ${}_{16}^{32}\text{X}$, ?



3. How many protons, neutrons, and electrons are in the following atoms?

	protons	neutrons	electrons
${}^{40}\text{Ar}$			
${}^{65}\text{Zn}$			
${}^{70}\text{Ga}$			
${}^{80}\text{Br}$			
${}^{184}\text{W}$			
${}^{243}\text{Am}$			

4. Nv is a fictitious element, which we will call nevadium (Nv). The isotopes of Nv have the following % of abundances:

$$\begin{array}{l} \text{\% abundance} \\ \text{\% abundance} \end{array} \begin{array}{l} {}^{293}\text{Nv} \\ {}^{295}\text{Nv} \end{array} = \begin{array}{l} 60 \\ 40 \end{array}$$

The mass of ${}^{293}\text{Nv}$ is 293.25 amu and that of ${}^{295}\text{Nv}$ is 295.35 amu

What is the atomic mass of ${}^{\text{c}}\text{Nv}$?

5. Write the electron level arrangement for each of the following atoms.
(For sodium, the answer would be 2,8,1)

phosphorus:

neon:

sulfur:

magnesium:

aluminum:

fluorine:

potassium:

helium:

nitrogen:

6. Of the elements O, S, Se, Te:
- Which is the largest atom?
 - Which is the smallest atom?
 - Which has the lowest ionization energy?
 - Which requires the most energy to remove an electron?
 - Which is found in Period 4?

7. Complete the following statements:

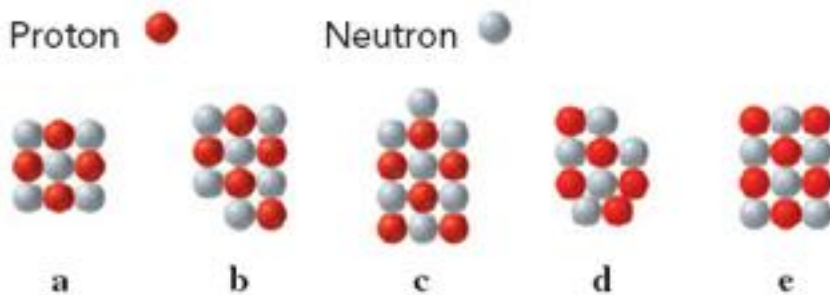
- The atomic number gives the number of _____ in the nucleus.
- In an atom, the number of electrons is equal to the number of _____.
- Sodium and potassium are examples of elements called _____.
- The number of protons and neutrons in an atom is also the _____ number.
- The elements in Group 7A (17) are called the _____.
- Elements that are shiny and conduct heat are called _____.

8. Complete the following table:

Name	Atomic Symbol	Number of Protons	Number of Neutrons	Number of Electrons
Potassium			22	
	$^{51}_{23}\text{V}$			
		48	64	
Barium			82	

9. a) Give the symbol of the element that has the smallest atomic size in Group 6A (16)
- b) Give the symbol of the element that has the smallest atomic size in Period 3
- c) Give the symbol of the element that has the highest ionization energy in Group 8A (18)
- d) Give the symbol of the element that has the lowest ionization energy in Period 4
- e) Give the symbol of the element that has the most metallic character in Group 3A (13)

10. For each representation of a nucleus



10.1 Write the atomic symbol of nucleus a, b, c, d and e

10.2. Classify a, b, c, d and e in metal, metalloid or non-metal.

10.3 Determine which ones are isotopes

ANSWERS

1. Check it in your periodic table.
2. C
3. ^{40}Ar $p, n, e = 18, 22, 18$; ^{65}Zn $p, n, e = 30, 35, 30$; ^{70}Ga $p, n, e = 31, 39, 31$;
 ^{80}Br $p, n, e = 35, 45, 35$; ^{184}W $p, n, e = 74, 110, 74$; ^{243}Am $p, n, e = 95, 148, 95$
4. 294.09 amu
5. phosphorus: 2, 8, 5 ; neon: 2,8 ; sulfur: 2,8,6 ; magnesium: 2,8,2 ; aluminum: 2,8,3 ; fluorine: 2,7 ; potassium: 2,8,8,1 ; helium: 2 ; nitrogen: 2,5
6. a) Te b) O c) Te d) O e) Se
7. a) protons b) protons c) alkali metals d) mass e) halogens f) metals
- 8.

Name	Atomic Symbol	Number of Protons	Number of Neutrons	Number of Electrons
Potassium	$^{41}_{19}\text{K}$	19	22	19
Vanadium	$^{51}_{23}\text{V}$	23	28	23
Cadmium	$^{112}_{48}\text{Cd}$	48	64	48
Barium	$^{138}_{56}\text{Ba}$	56	82	56

9. a) O b) Ar c) He d) K e) Tl

10.1 a) ^9_4Be b) $^{11}_5\text{B}$ c) $^{13}_6\text{C}$ d) $^{10}_5\text{B}$ e) $^{12}_6\text{C}$

10.2 a) metal b) metalloid c) non-metal d) metalloid e) non-metal

10.3 b and d are isotopes; c and e are isotopes