Unit 2 Problem Set

Learning Objective: *Describe the properties of protons, neutrons, electrons, atoms, ions and isotopes*

Read more about this topic: Section 2.3

1. For each of the following isotopes, identify the number or protons, neutrons and electrons. Identify the mass number and the atomic number for each isotope.
   a. Neon-22
   b. Sulfur-33

2. For each of the following isotopes, identify the number or protons, neutrons and electrons. Identify the mass number and the atomic number for each isotope.
   a. Tungsten-182
   b. Gadolinium-152

3. For each of the following isotopes, identify the number or protons, neutrons and electrons. Identify the mass number and the atomic number for each isotope.
   a. ${}^{98}_{46}X$
   b. ${}^{110}_{53}X$

4. For each of the following isotopes, identify the number or protons, neutrons and electrons. Identify the mass number and the atomic number for each isotope.
   a. ${}^{115}_{55}X^{2+}$
   b. ${}^{76}_{35}X^{2-}$

5. What is the average atomic mass in amu for the following element Z

Isotope	**Mass (amu)**	**Percent Abundance**
^{32}Z	31.964	75.463
^{33}Z	32.988	18.108
^{34}Z	33.911	6.429

6. What is the mass of isotope ^{64}X if the average atomic mass of element X is 60.136 amu?

Isotope	Mass (amu)	Percent Abundance
^{58}X	58.073	38.032
^{60}X	60.008	36.890
^{64}X	????	25.078

Watch a video of a similar topic

7. An element with two stable isotopes ^{78}X, 78.009 amu and ^{81}X, 81.200 amu has an average atomic mass of 79.307 amu. What is the percent abundance of ^{78}X?
Watch a video of a similar problem

8. Identify which two are isotopes in each group

a. $^{28}_{14}X$ $^{30}_{14}Z$ $^{30}_{16}Y$

b. $^{40}_{19}X$ $^{40}_{18}Z$ $^{41}_{19}Y$

Learning Objective: *Write formulas and names for elements, cations and anions, oxoacids; and ionic and covalent compounds*
Read more about this topic: Section 2.6; Section 1.7; Section 1.4

9. Identify the most likely ion for each of the following elements

a. Sr
b. Li

10. Identify the most likely ion for each of the following elements

a. O
b. S

11. Question Group

a. A compound is formed between a nonmetal in Group 16 (Y) and a metal in Group 2 (X). What is the most likely formula for this compound?
b. A compound is formed between a nonmetal in Group 15 (Y) and a metal in Group 2 (X). What is the most likely formula for this compound?

12. Give the formula for each of the following compounds

a. Potassium Sulfite
b. Calcium Nitrite

13. Give the formula for each of the following compounds

a. Chromium (II) Oxide
b. Scandium (III) Oxide

14. Give the formula for each of the following compounds

a. Carbon Tetrabromide
b. Sulfur Trioxide

15. Choose the correct name for NO_2

a. Nitrogen Oxide
b. Nitrogen Dioxide
c. Nitrogen (II) Oxide
d. Nitrogen (IV) Oxide

16. Choose the correct name for $RbClO_4$

a. Rubidium Perchlorate
b. Rubidium (I) Perchlorate
c. Rubidium Chlorine Oxide
d. Rubidium Chloroxide

17. Choose all of the following substances that are compounds:

a. O_2
b. CH_4
c. $BaClO_3$
d. Mg

18. Choose all of the following substances that are elements:

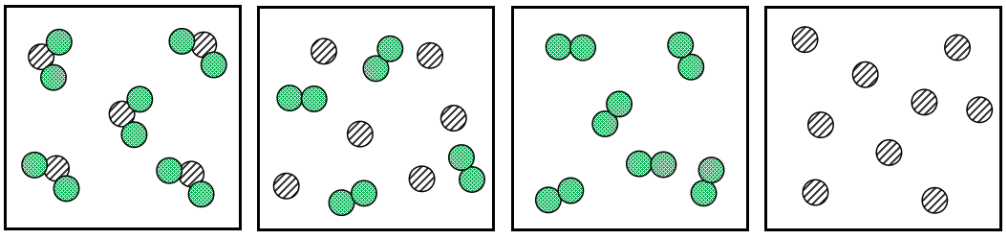
a. Al
b. P_4
c. H_2O
d. $CaCl_2$

Learning Objective: *Distinguish elements from compounds, pure substances from mixtures, homogeneous from heterogeneous mixtures (solutions), and physical from chemical properties*

19. Identify whether each of the following are a chemical or a physical change

a. The copper in the statue of liberty oxidizes to copper oxide and other minerals
b. After a heavy rain, the puddles of water will evaporate
c. Cookie dough placed into a hot oven bakes
d. Gasoline is burned in a car engine

20. Correctly identify each of the following as either a compound, mixture, or element



A **B** **C** **D**