Test 2 Review

1. According to the law of multiple proportions:

a) if the same two elements form two different compounds, they do so in the same ratio.

b) it is not possible for the same two elements to form more than one compound.

c) the ratio of the masses of the elements in a compound is always the same.

d) the total mass after a chemical change is the same as before the change.

e) none of these

2. Many classic experiments have given us indirect evidence of the nature of the atom. Which of the experiments listed below did not give the results described?

a) The Rutherford experiment proved the Thomson "plum-pudding" model of the atom to be essentially correct.

b) The Rutherford experiment was useful in determining the nuclear charge on the atom.

c) Millikan’s oil-drop experiment showed that the charge on any particle was a simple multiple of the charge on the electron.

d) The electric discharge tube proved that electrons have a negative charge.

3. Which of the following pairs can be used to illustrate the law of multiple proportions?

a) SO and SO2

b) CO and CaCo3

c) H2O and C12H22O11

d) H2SO4 and H2S

e) KCl and KClO2

4. The element rhenium (Re) exists as two stable isotopes and 18 unstable isotopes. Rhenium-185 has in its nucleus

a) 75 protons, 75 neutrons.

b) 75 protons, 130 neutrons.

c) 130 protons, 75 neutrons.

d) 75 protons, 110 neutrons.

e) not enough information is given.

5. Which statement is *not* correct?

a) The mass of an alpha particle is 7300 times that of the electron.

b) An alpha particle has a 2+ charge.

c) Three types of radioactive emission are gamma rays, beta rays, and alpha particles.

d) A gamma ray is high-energy "light."

e) There are only three types of radioactivity known to scientists today.

6. An ion is formed

a) by either adding or subtracting protons from the atom.

b) by either adding or subtracting electrons from the atom.

c) by either adding or subtracting neutrons from the atom.

d) All of these are true.

e) Two of these are true.

7. All of the following are characteristics of metals *except*:

a) good conductors of heat b) malleable

c) ductile d) often lustrous

e) tend to gain electrons in chemical reactions

8. Which metals form cations with varying positive charges?

a) transition metals b) Group 1 metals c) Group 2 metals

d) Group 3 metals e) metalloids

9. The correct name for FeO is

a) iron oxide b) iron (II) oxide c) iron (III) oxide

d) iron monoxide e) iron (I) oxide

10. All of the following are in aqueous solution. Which is incorrectly named?

a) H2SO4, sulfuric acid

b) H2CO3, carbonic acid

c) H3PO4, phosphoric acid

d) HCN, cyanic acid

e) HCl, hydrochloric acid

11. Naturally occurring iron contains 5.82% Fe, 91.66% Fe, 2.19% Fe, and 0.33% Fe. The respective atomic masses are 53.940 amu, 55.935 amu, 56.935 amu, and 57.933 amu. Calculate the average atomic mass of iron.

12. Naturally occurring element X exists in three isotopic forms: X-28 (27.977 amu, 92.21% abundance), X-29 (28.976 amu, 4.70% abundance), and X-30 (29.974 amu, 3.09% abundance). Calculate the atomic weight of X.

a) 28.1 amu b) 54.0 amu c) 29 amu d) 72.7 amu e) 36.2 amu

13. What is the molar mass of ethanol (C2H5OH)?

a) 45.07 b) 38.90 c) 46.07 d) 34.17 e) 62.07

14. A sample of ammonia(NH3) has a mass of 56.6 g. How many molecules are in this sample?

a) 3.32 molecules b) 17.03  1024 molecules c) 6.78 1023 molecules

d) 2.00 1024 molecules e) 1.78 1024 molecules

15. How many atoms of hydrogen are present in 6.0 g of water?

a) 2.0 x 1023 b) 7.2 x 1024 c) 1.1 x 1024 d) 4.0 x 1023 e) 0.66

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