

Multiple Choice. Clearly write the letter corresponding to the correct answer in the space provided.
(4 points each)

___1) Which of the following molecules is/are polar?

I. HCl II. CH₂Cl₂ III. H₂O IV. CO₂

(a) I, II, III and IV (b) I, II and III (c) III and IV (d) III only (e) none are polar molecules

___2) Which of the following molecules is a radical?

(a) NO (b) CO (c) CH₄ (d) H₂O (e) none of the above

___3) How many moles of nitrogen atoms are in 0.50 moles of N₂H₄?

(a) 0.50 (b) 0 (c) 0.25 (d) 1.0 (e) none of the above

___4) Which of the following is/are ionic compounds?

I. BeCl₂ II. AlBr₃ III. LiI IV. Al₂O₃

(a) IV only (b) II and IV (c) I, II, III (d) I, II, III, IV (e) none are ionic

___5) The VSEPR geometry of a compound with 3 bonded atoms and 1 lone pair is

(a) tetrahedral (b) pyramidal (c) trigonal planar (d) bent

(e) cant determine from the information given

___6) When blood calcium levels are low, vitamin D will NOT affect which of the following?

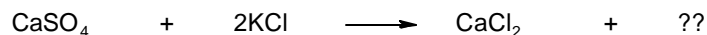
(a) Bones (b) Liver (c) Kidneys (d) Intestines

(e) all of the above are affected.

___7) How much would 0.25 moles of potassium bicarbonate weigh in grams?

(a) 25.0 g (b) 23.0 g (c) 14.7 (d) 34.6 (e) none of the above

___8) What is the name of the missing product from the reaction below:



(a) dipotassium sulfate (b) calcium chloride (c) potassium bisulfate

(d) potassium sulfate (e) none of the above

Name _____

- ___9) How many molecules of carbon tetrachloride are present in 2.5 g?
(a) 9.8 (b) 0.016 (c) 1.6×10^{23} (d) 9.8×10^{21} (e) none of the above
- ___10) Which of the following molecules has/have bent VSEPR geometry?
I. Si_2 II. CO_2 III. CH_2Br_2 IV. SO_4^-
(a) II and IV (b) I only (c) I and II (d) I, II, III and IV
(e) none have bent geometry
- ___11) What is the mass **in grams** of one carbon atom?
(a) 12.01 g (b) 6.02×10^{23} g (c) 2×10^{-23} g (d) 1.201×10^{-23}
(e) cant calculate from the information given
- ___12) Which of the following is the correct formula for magnetite (the magnetic compound found in the brains of birds and fish?)
(a) Fe_2O_3 (b) Fe_3O_2 (c) Fe_4O_3 (d) Fe_3O_4 (e) none of the above
- ___13) Which of the following is/are NOT an example of activation energy?
(a) spark igniting gasoline (b) impact causing NaN_3 to decompose to $\text{Na} + \text{N}_2$
(c) heat released when sodium hydroxide dissolves in water
(d) impact causing nitroglycerin to explode (e) all are examples of activation energy
- ___14) Which of the following describes an endothermic reaction?
(a) ΔH is positive and heat is released (b) ΔH is negative and heat is released
(c) ΔH is negative and heat is absorbed (d) ΔH is positive and heat is absorbed
(e) none of the above
- ___15) How many moles of O_2 are necessary to produce 2 moles of water given the following **unbalanced** reaction?
 $? \text{C}_3\text{H}_8 + ? \text{O}_2 \longrightarrow ? \text{CO}_2 + ? \text{H}_2\text{O}$
(a) 5 moles (b) 2.5 moles (c) 4 moles (d) 2 moles
(e) none of the above

Name _____

16) **CLEARLY Write** either the name of the compound or the correct chemical formula in the space provided of the compounds given below. **(2 points each)**

a) _____ calcium phosphate

b) _____ potassium permanganate

c) _____ Li_2SO_4

d) _____ SF_2

17) Draw the Lewis structure and assign the VSEPR geometry of the following molecules:
(both molecules obey the octet rule) **(8 points each)**

(a) HNO_3 VSEPR geometry _____

(b) PHCl_2 VSEPR geometry _____

Name _____

Calculation problems. For credit you must **SHOW YOUR WORK!** Clearly circle your final answers. Your answer should include the appropriate units and answers **must** be reported to **TWO** decimal places! **Your answer MUST include the balanced equation for full credit. (8 points each)**

17) Glucose ($C_6H_{12}O_6$), the main source of usable energy for cells, reacts with oxygen to produce the waste product called carbon dioxide (CO_2) and water. What mass in grams of carbon dioxide is produced from reacting 10.7 g of oxygen with glucose?

(18) $Ca(OH)_2$ will react with HCl to form $CaCl_2$ and water. How many grams of water would be produced by reacting 29.0 g $Ca(OH)_2$?