

Honors Chemistry Assorted Review Questions

- How many centimeters are in 25.0 meters?
(a) 2.50 cm (b) 0.250 cm (c) 2500 cm (d) 250 cm
- The volume of a box measuring 14.32 cm X 2.18 cm X 0.52 cm to the correct number of significant figures is
(a) 16.23 cm^3 (b) 16.2 cm^3 (c) 16 cm^3 (d) 20 cm^3
- An aluminum object has a mass of 25.21 grams. The density of aluminum is 2.70 g/cm^3 . The volume is
(a) 68.10 cm^3 (b) 9.34 cm^3 (c) 0.11 cm^3 (d) 68.1 cm^3
- Isotopes differ from each other in
(a) nuclear charge (b) number of protons
(c) chemical reactivity (d) number of neutrons
- Complete the following table:

Element	Atomic #	Mass #	Protons	Neutrons	Electrons
		27	13		
		137	56		
				18	17
	15			16	

- Which of these formulas is incorrectly written?
(1) ZnCl (2) NaCl (3) KCO_3 (4) FeO (5) MgOH
(a) 1, 3 and 4 (b) 2, 4, and 5 (c) 2 and 3 (d) 3 and 4 (e) 1, 3 and 5
- Bromine reacts with element M to form MBr_2 . Which element could M be?
(a) Na (b) O (c) Al (d) Mg
- Which of the following is named incorrectly?
(a) K_2S potassium sulfide
(b) MgCl_2 magnesium chloride
(c) FeO iron oxide
(d) NH_4NO_2 ammonium nitrite
- Given this data:
Mass of dish 60.28 g
Mass of dish + Cu 85.78 g
You can determine the moles of copper to be
(a) 1.349 moles (b) 0.949 moles (c) 0.4013 moles (d) 3590 moles

10. The atomic number of an element tells
- the number of protons in the nucleus
 - the number of electrons in the neutral atom
 - the number of neutrons in the nucleus
 - both a and c
 - both a and b
11. A compound of only carbon and hydrogen was found to contain 6.0 grams of carbon and 1.0 grams of hydrogen. What is the empirical formula of the compound?
- CH
 - CH₂
 - C₆H
 - CH₆
12. The idea that the mass of an atom is concentrated in a very small center is a result of the experiments of
- Avogadro
 - Dalton
 - Thomson
 - Rutherford
13. Which of the following is a mixture?
- table salt
 - sugar
 - air
 - water
14. Approximately how many molecules are in 4.0 grams of methane, CH₄?
- 1.5×10^{23}
 - 3.9×10^{23}
 - 6.0×10^{23}
 - 2.4×10^{24}
15. Which of the following is an example of a single replacement reaction?
- hydrogen + oxygen →
 - sodium + potassium chloride →
 - sugar + water →
 - silver nitrate + sodium chloride →
16. In preparing 1.580 grams of magnesium oxide, 0.948 grams of magnesium was burned. According to this experimental data, what is the empirical formula of magnesium oxide?
- Mg₂O
 - MgO₂
 - MgO
 - Mg₉O₆
17. Which element of period 3 has the largest atomic radius?
- Na
 - Al
 - P
 - Cl
18. The electron configuration $1s^2 2s^2 2p^6$ could describe
- an argon atom
 - an oxygen atom
 - an ion of magnesium
 - none of these
19. How many molecules of CH₄O are in 32.0 g ?
- 5.32×10^{-23}
 - 1.00
 - 1.88×10^{22}
 - 6.02×10^{23}
20. A sample of vitamin A, C₂₀H₃₀O, contains 4.0×10^{22} atoms of carbon. How many atoms of hydrogen and how many molecules of vitamin A does it contain?
- 6.0×10^{22} atoms of H, 4.0×10^{22} molecules of vitamin A
 - 4.0×10^{22} atoms of H, 4.0×10^{22} molecules of vitamin A
 - 6.0×10^{22} atoms of H, 2.0×10^{21} molecules of vitamin A
 - 6.0×10^{22} atoms of H, 8.0×10^{23} molecules of vitamin A
21. How many F⁻ ions are present in 2.50 mol of BaF₂?
- 5.00
 - 3.01×10^{24}
 - 1.51×10^{24}
 - 2.50
 - 6.02×10^{24}
22. Calculate the mass percent of nitrogen in HNO₃.
- 22.2 %
 - 20.0 %
 - 25.0 %
 76. %
 - none of these

23. What is the mass in grams of 0.257 mol of sucrose, $C_{12}H_{22}O_{11}$?
(a) 342 g (b) 7.51×10^{-5} g (c) 88.0 g (d) 8.80 g e. 12.5 g
24. Give the empirical formula of the following compound if a sample contains 40.0 % C, 6.7 % H, and 53.3 % O by mass.
(a) C_4HO_5 (b) CH_2O (c) $C_2H_4O_2$ (d) $C_3H_6O_3$
25. What is the molecular formula of a compound with the empirical formula CH_2 and a molecular weight of 112.0 amu?
(a) C_8H_{16} (b) CH_8 (c) C_2H_4 (d) C_8H (e) CH_2
26. If the atoms that share electrons have an unequal attraction for the electrons, the bond is called
(a) nonpolar. (c) ioni(c)
(b) polar. (d) dipolar.
27. What group of elements satisfies the octet rule without forming compounds?
(a) halogen (c) alkali metal
(b) noble gas (d) alkaline-earth metal
28. Compared with ionic compounds, molecular compounds
(a) have higher boiling points. (c) have lower melting points.
(b) are brittle. (d) are harder.
29. According to VSEPR theory, the shape of an AB_3 molecule is
(a) trigonal-planar. (c) linear.
(b) tetrahedral. (d) bent.
30. According to VSEPR theory, the structure of the ammonia molecule, NH_3 , is
(a) trigonal-planar. (c) trigonal-pyramidal.
(b) bent. (d) tetrahedral.
31. Use VSEPR theory to predict the shape of the carbon tetraiodide molecule, CI_4 .
(a) tetrahedral (c) bent
(b) linear (d) trigonal-planar
32. Use VSEPR theory to predict the shape of the chlorate ion, ClO_3^- .
(a) trigonal-planar (c) trigonal-pyramidal
(b) octahedral (d) bent
33. Use VSEPR theory to predict the shape of carbon dioxide, CO_2 .
(a) tetrahedral (c) bent
(b) linear (d) octahedral
34. Determine the mass of oxygen contained in 25.64 grams of carbon dioxide.
35. Determine the formula of each compound whose composition is given below:
(a) 0.448 gram sulfur (b) 32.79% Na
0.672 gram oxygen 13.02% Al
(name this compound) 54.19% F
36. A hydrate of sodium carbonate is heated for analysis. A 2.714 gram sample is heated to remove the water, leaving 1.006 grams of anhydrous sodium carbonate. Determine the probable formula of the hydrate.