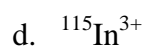
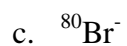
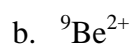
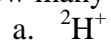


7. How many protons, neutrons and electrons are present in:



8. Write the chemical formulas of:

a. selenium trioxide

f. magnesium oxide

b. carbon tetrachloride

g. chlorine trifluoride

c. carbon disulfide

h. iron (II) permanganate

d. phosphorous pentachloride

i. copper (II) nitrate hexahydrate.

e. aluminum sulfate

9. Calculate the mass, in grams, of a water molecule.

10. Determine the number of water molecules in 1.00g of H_2O .

11. Calculate the molar mass of C_6H_6 , K_2SO_4 and $\text{Ca}(\text{NO}_3)_2$.

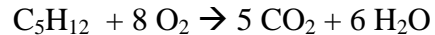
12. Calculate the mass in grams of 1.12 mol of CaH_2 .

13. Write the complete, total ionic and net ionic equations for the reaction of BaCl_2 with Na_2SO_4

14. How many grams of barium sulfate are formed when 635 mL of 0.214 M Na_2SO_4 reacts with 100 mL of 1.15 M BaCl_2 ? (use problem #13)

15. How many grams of KNO_3 must be dissolved in 250. mL of water to form 0.300 M KNO_3 ?

16. How many liters of O₂ at 0.975 atm and 300 K are consumed in the combustion of 2.50 g of C₅H₁₂.



17. A fixed amount of He exerts a pressure of 775 mmHg in a 1.05L glass container at 26°C. At what temperature would the gas pressure equal 725 mmHg?

18. A gas sample has 5.00 mol of N₂ and 17.0 mol of O₂. Calculate the mole fractions and partial pressures of each gas if the pressure of the system is 1.43 atm.

19. Calculate the energy of a mole of photons that has a frequency of $7.42 \times 10^{14} \text{ s}^{-1}$. Is this energy greater or less than that of light of 655-nm wavelength?

20. Write all possible sets of quantum numbers for $n = 4$.

21. Write all possible sets of quantum numbers for electrons in the 3p orbital.

22. Indicate whether each of the following is a valid set of quantum numbers. If a set is not valid, indicate why.

a. $n = 2, l = 1, m_l = 1$

c. $n = 3, l = 2, m_l = -2$

b. $n = 3, l = 3, m_l = -3$

d. $n = 1, l = 2, m_l = 0$

23. Write the electron configuration and the noble gas configuration of Al, Cl, Ga and Sr. Indicate if the atom is paramagnetic or diamagnetic.
24. Arrange the following elements in order of increasing atomic radii: Al, C and Si.
25. Arrange the following elements in order of increasing first ionization energy: F, Na, Fe, Cl and Ne.
26. Draw the Lewis Dot structures for the following molecules: ClF_3 , SeF_4 , IF_5 and XeF_6^{2+} . Give the molecular geometry and the hybridization. Also indicate whether the molecule is polar or nonpolar.

27. Which of the following would you expect to have the higher boiling point: C_6H_{14} or C_8H_{18} ?
28. Explain which of the following liquids you would expect to have the higher surface tension: C_8H_{18} or $C_8H_{17}OH$.
29. The base sequence along one strand of DNA is ATTCGC. What would be the complementary base pair strand?