**Chapter 2 :- Atoms , Molecules, and Ions**

2.7 The diameter of a helium atom is about 1 X 102 pm. Suppose that we could line up helium atoms side by side in contact with one another. Approximately how many atoms would it take to make the distance from end to end 1 cm?

2.16 Indicate the number of protons, neutrons, and electrons in each of the following species:



2.17 Write the appropriate symbol for each of the following isotopes: (a) Z = 11, A = 23; (b) Z = 28, A = 64.

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2.18 Write the appropriate symbol for each of the following isotopes: (a) Z = 74, A = 186; (b) Z = 80; A = 201.

2.63 One isotope of a metallic element has mass number 65 and 35 neutrons in the nucleus. The cation derived from the isotope has 28 electrons. Write the symbol for this cation.

2.64 One isotope of a nonmetallic element has mass number 127 and 74 neutrons in the nucleus. The anion derived from the isotope has 54 electrons. Write the symbol for this anion

2.33 Identify the following as elements or compounds: NH3, N2, S8, NO, CO, CO2, H2, SO2.

2.68 Which of the following are elements, which are molecules but not compounds, which are compounds but not molecules, and which are both compounds and molecules? (a) SO2, (b) S8, (c) Cs, (d) N2O5, (e) O, (f) O2, (g) O3, (h) CH4, (i) KBr, (j) S, (k) P4, (l) LiF

2.49 & 2.50 Which of the following compounds are likely to be ionic? Which are likely to be molecular? SiCl4, LiF, BaCl2, B2H6, KCl, C2H4, CH4, NaBr, BaF2, CCl4, ICl, CsCl, NF3

2.35 & 2.36 Give the number of protons and electrons in each of the following common ions: K+, Mg2+, Fe3+, Br-, Mn2+, C4-, Cu2+ , Na+ , Ca2+, Al3+, Fe2+, I-, F-, S2-, O2-, and N3-

2.69



2.75



2.45 What are the empirical formulas of the following compounds? (a) C2N2, (b) C6H6, (c) C9H20, (d) P4O10, (e) B2H6

2.46 What are the empirical formulas of the following compounds? (a) Al2Br6, (b) Na2S2O4, (c) N2O5, (d) K2Cr2O7

2.57 Name these compounds: (a) Na2CrO4, (b) K2HPO4, (c) HBr (gas), (d) HBr (in water), (e) Li2CO3, (f) K2Cr2O7, (g) NH4NO2, (h) PF3, (i) PF5, (j) P4O6, (k) CdI2, (l) SrSO4, (m) Al(OH)3, (n) Na2CO3 . 10H2O.

2.58 Name these compounds: (b) Ag2CO3, (c) FeCl2, (d) KMnO4, (e) CsClO3, (f) HIO, (g) FeO, (h) Fe2O3, (i) TiCl4, (j) NaH, (k) Li3N, (l) Na2O, (n) FeCl3.6H2O

2.59 Write the formulas for the following compounds: (a) rubidium nitrite, (b) potassium sulfide, (c) sodium hydrogen sulfide, (d) magnesium phosphate, (e) calcium hydrogen phosphate, (f) potassium dihydrogen phosphate, (g) iodine heptafluoride, (h) ammonium sulfate, (i) silver perchlorate, (j) boron trichloride

2.60 Write the formulas for the following compounds: (a) copper(I) cyanide, (b) strontium chlorite, (c) perbromic acid, (d) hydroiodic acid, (e) disodium ammonium phosphate, (f) lead(II) carbonate, (g) tin(II) fluoride, (h) tetraphosphorus decasulfide, (i) mercury(II) oxide, (j) mercury(I) iodide, (k) selenium hexafluoride

2.73 What is wrong with the name (in parentheses) for each of the following compounds: (a) BaCl2 (barium dichloride), (b) Fe2O3 [iron(II) oxide], (c) CsNO2 (cesium nitrate), (d) Mg(HCO3)2 [magnesium(II) bicarbonate]?

2.74 What is wrong with the chemical formula for each of the following compounds: (a) (NH3)2CO3 (ammonium carbonate), (b) CaOH (calcium hydroxide), (c) CdSO3 (cadmium sulfide), (d) ZnCrO4 (zinc dichromate)