**SECTION 10.1 THE MOLE: A MEASUREMENT OF MATTER**

**1.** What is the molar mass of sucrose (C12H22O11)?

**2.** What is the molar mass of each of the following compounds?

**a.** phosphorus pentachloride (PCl5)

**b.** uranium hexafluoride (UF6)

**3.** Calculate the molar mass of each of the following ionic compounds:

**a.** KMnO4

**b.** Ca3(PO4)2

**4.** How many moles is 3.52X1024 molecules of water?

**5.** How many atoms of zinc are in 0.60 mol of zinc?

**6.** What is the mass of 1.00 mol of oxygen (O2)?

**SECTION 10.2 MOLE–MASS AND MOLE–VOLUME RELATIONSHIPS**

**1.** What is the molar mass of each of the following compounds?

**a.** C6H12O6  **b.** NaHCO3 **c.** C7H12  **d.** KNH4SO4

**2.** Calculate the mass in grams of each of the following:

**a.** 8.0 mol lead oxide (PbO) **d.** 1.50X102 mol molecular oxygen (O2)

**b.** 0.75 mol hydrogen sulfide (H2S) **e.** 2.30 mol ethylene glycol (C2H6O2)

**c.** 0.00100 mol silicon tetrahydride (SiH4)

**3.** How many grams are in 1.73 mol of dinitrogen pentoxide (N2O5)?

**4.** How many grams are in 0.658 mol of calcium phosphate [Ca3(PO4)2]?

**5.** Calculate the number of moles in each of the following:

**a.** 0.50 g sodium bromide (NaBr) **d.** 0.00100 g monochloromethane (CH3Cl)

**b.** 13.5 g magnesium nitrate [Mg(NO3)2] **e.** 1.50 x103 g propylene glycol[C3H6(OH)2]

**c.** 1.02 g magnesium chloride (MgCl2)

**6.** A chemist plans to use 435.0 grams of ammonium nitrate (NH4NO3) in a reaction. How many moles of the compound is this?

**7.** A solution is to be prepared in a laboratory. The solution requires 0.0465 mol of quinine (C20H24N2O2). What mass, in grams, should the laboratory technician obtain in order to make the solution?

**8.** What is the volume at STP of 2.66 mol of methane (CH4) gas?

**9.** How many moles is 135 L of ammonia (NH3) gas at STP?

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