

## CHEMICAL QUANTITIES

## **Practice Problems**

On a piece of paper, solve the following problems.

YOU MUST SHOW YOUR WORK TO GET CREDIT FOR YOUR ANSWERS!!!

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

- What is the molar mass of sucrose (C<sub>12</sub>H<sub>22</sub>O<sub>11</sub>)?
- 2. What is the molar mass of each of the following compounds?
  - a, phosphorus pentachloride (PCI-)
  - b. uranium hexafluoride (UF<sub>4</sub>)
- 3. Calculate the molar mass of each of the following ionic compounds:
  - a. KMinO<sub>4</sub>
  - b. Cas(PO<sub>4</sub>):
- 4. How many moles is 3.52 × 1024 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 exygen (O2)?

## SECTION 10.2 MOLE-MASS AND MOLE-VOLUME RELATIONSHIPS

- 1. What is the molar mass of each of the following compounds?
  - a. CaHagOa

b. NaHCOs.

e. Calling

d. KNH4SO<sub>4</sub>

- 2. Calculate the mass in grams of each of the following:
  - a. 8.0 mol lead oxide (PbO).

- d. 1.50 × 10<sup>-2</sup> mol molecular oxygen (O<sub>5</sub>)
- b. 0.75 mol hydrogen sulfide (H<sub>2</sub>S)

- e. 2.30 mol ethylene glycol (C<sub>2</sub>H<sub>2</sub>O<sub>2</sub>)
- e. 0.00100 mol silicon tetrahydride (SiH<sub>4</sub>).
- How many grams are in 1.73 mol of dinitrogen pentoxide (N<sub>2</sub>O<sub>2</sub>)?
- How many grams are in 0.658 mol of calcium phosphate [Ca<sub>2</sub>(PO<sub>4</sub>)<sub>2</sub>]?
- 5. Calculate the number of moles in each of the following:
  - a. 0.50 g sodium bromide (NaBr).

- d, 0.00100 g monochloromethane (CH<sub>2</sub>CI)
- b. 13.5 g magnesium nitrate [Mg(NO<sub>1</sub>)<sub>2</sub>]
- e.  $1.50 \times 10^{-3}$  g propylene glycol [C<sub>3</sub>H<sub>4</sub>(OH)<sub>2</sub>]
- e. 1.02 g magnesium chloride (MgCl<sub>2</sub>)
- 6. A chemist plans to use 435.0 grams of ammonium nitrate (NH<sub>4</sub>NO<sub>5</sub>) 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 (C<sub>20</sub>H<sub>24</sub>N<sub>2</sub>O<sub>2</sub>). 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 (CHa) gas?
- 9. How many moles is 135 L of ammonia (NH<sub>3</sub>) gas at STP?

# **Chemistry Chapter 10 Study Guide Answers**

Joan I. Senyk, Darrell D. Ebbing

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