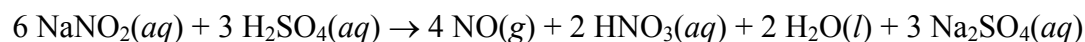


## Chapter 5 Example Problems

1. Nitrogen monoxide (NO) plays a crucial regulatory role in human physiology. Studies on the effect of NO on blood pressure were recognized by the 1998 Nobel Prize in Physiology or Medicine. A medical researcher decides to generate NO in her laboratory by the following reaction (collecting the NO(g) over water):



How many mL of 0.646 M  $\text{NaNO}_2(aq)$  should she use to generate 5.00 L of wet NO(g) at a temperature of 20.0°C under a total pressure of 0.993 atm? (Assume that  $\text{H}_2\text{SO}_4(aq)$  is present in excess.)

2. (Relevant to lab this week!) An unknown compound contains 80.0% C and 20.0% H by mass. A 0.2367-g sample has a volume of 191.7 mL at 22°C and 756.8 Torr. Find the compound's molecular formula.
3. We have two samples of gas:

- i:** 1.00 mol of fluorine at 300 K and 2.00 atm  
**ii:** 1.00 mol of chlorine at 300 K and 1.00 atm

Assuming ideal gas behavior, choose the correct answer for each of the following comparisons.

- (a) The volumes occupied by the two samples:

**i** is larger                      **ii** is larger                      they are the same

- (b) The average speeds of the molecules in the two samples:

**i** is larger                      **ii** is larger                      they are the same

- (c) The average kinetic energies of the two samples:

**i** is larger                      **ii** is larger                      they are the same