

Chemistry 105 - Gas Stoichiometry and Mixtures

1. If 1.0×10^3 g of uranium are converted to gaseous UF_6 what pressure of UF_6 would be observed at 32°C in a chamber that has a volume of $3.0 \times 10^2\text{L}$? **0.35 atm**

2. $\text{Ni}(\text{CO})_4$ can be made by reacting finely divided nickel with gaseous CO. If you have CO in a 1.50 L flask at a pressure of 418 mm Hg at 25.0°C , what is the maximum number of grams of $\text{Ni}(\text{CO})_4$ that can be made? **1.44 g**

3. If boron hydride B_4H_{10} is treated with pure oxygen it combusts to give B_2O_3 and H_2O .



If a 0.050 g sample of the boron hydride burns completely in O_2 , what will be the pressure of gaseous water in a 4.25 L flask at 30.0°C ? **0.027 atm**

4. Hydrazine reacts with O_2 according to the equation



Assume the $\text{O}_2(\text{g})$ to combust the hydrazine is in a 450 L tank at 26°C . If you wish to combust completely a 1.0×10^1 kg sample of hydrazine, to what pressure should you fill the O_2 tank in order to have sufficient oxygen? **17.02 atm**

5. Butane can be used as a fuel in an automobile engine. It burns in O_2 according to the equation



If one cylinder of the engine is filled with butane to a pressure of 1.5 atm at 500°C , it requires 2.45 g of O_2 for complete combustion. How many grams of O_2 would be required if the cylinder were filled with butane at a total pressure of 2.0 atm at 500°C ? **3.3 g**

6. Hydrogen can be made in the "water gas reaction."



If you begin with 250 L of gaseous water at 120°C and 2.0 atm pressure, how many grams of H_2 can be made? **31 g**

7.* What is the pressure in atmospheres of a gas mixture that contains 1.0 g of H_2 and 8.0 g of Ar in a 3.0-L container at 27°C ? **5.7 atm**

8. A 3.0-L glass bulb containing He at 145 mm Hg is connected by a valve to a 2.0 L glass bulb containing Ar at 355 mm Hg. Calculate the partial pressure of each gas and the total pressure after the valve between the flasks is opened. **0.30 atm**