WS 7.3 Ideal Gas Law (pg 1)

$PV=nRT$ $R = 0.08206 \frac{L \cdot atm}{mol \cdot K}$

1. What volume would 3.00 moles of neon gas have at 295 K and 645 mmHg?

Ans: _____

2. What volume would 4.3 moles of hydrogen gas occupy at 45°C and 3.22 atm?

Ans: _____

3. How much pressure would 4.85 moles of He gas exert in a 4.50 L tank at 55°C?

Ans: _____

4. How many moles of CO_2 could fit in a 475 mL bag at -22°C and 855 mmHg?

Ans: _____

5. How many grams of oxygen gas are there in a 2.3 L tank at 7.5 atm and 24°C?

Ans: _____

6. How many molecules of N_2 could fit in a 2.00 L soda bottle at 23°C and 755 mmHg?

Ans: _____

7. What pressure would be needed to fit 35.0 g of N_2 gas into a 195 mL flask at 0°C?

Ans: _____

8. In order to have 1.00 mole of gas fit in a box that measures 1.30 dm x 2.40 dm x 5.83 dm at 1.00 atm, what must the temperature be (in °C)? (*1 L = 1 dm³*)

Ans: _____

9. A cube-shaped box is to be made that can hold precisely 40.0 grams of He at 1.05 atm and 55°C. How long would the box have to be?   (*remember it's a cube so take the cube root of the volume*)

Ans: _____

10. What volume would be occupied by 16.0 g of CH_4 at 0°C and 760 mmHg?
(notice it's at STP?)

Ans: _____

(continued on next page!)

11. **a)** What is the mass of 1.00 mole of Ne? **b)** What would be the volume of 1.00 mole of Ne at 34°C and 0.862 atm? **c)** What would be the density of 1.00 mole of Ne at 34°C and 0.862 atm?

a: _____ b: _____ c: _____

12. What is the density of helium at 2.15 atm and -45°C?

Ans: _____

13. Determine the density of fluorine gas at 595 mmHg and 423 K.

Ans: _____

14. What is the density of helium at STP?

Ans: _____

15. 2.58 g of a gas has a volume of 3.97 L at 745 mmHg and 21°C. Determine the molecular weight of the gas. What gas might it be?? (see choices in ans. bank)

Ans: _____ _____

16. 2.58 g of a different gas has a volume of 31.8 L at 745 mmHg and 21°C. Determine the molecular weight of the gas. What gas might it be?? (see choices in ans. bank)

Ans: _____ _____

17. How many moles of sodium will react with 2.6 L of Cl_2 gas at 1.15 atm and 39°C? Hint: use the balanced equation... **2 Na + Cl_2 ---> 2 NaCl**

Ans: _____

18. How many grams of propane (C_3H_8) will react with 3.29 L of O_2 at 1.05 atm and -34°C? Hint: balance & use this equation... ___C_3H_8 +_____O_2 ---> ___CO_2 +_____H_2O

Ans: _____

Ans (IRO+3): -51 0.0259 0.179 0.23 0.459 0.691 0.857   1.55 2.00 6.35 16 20.2 22.4 22.6 26.9 29.0 29.2 35 85.6 144 20,500 2.3E22 4.9E22 CH_4 H_2 g/mol g/mol

Units (IRO+3): L L L L L g/L g/L g/L g/L g g g g g mmHg mmHg atm atm mol mol molecule °C dm