Name_____ I.D. #_____ Date_____ Period_____

Chem A	Chapter 11
	Gas Law Practice Problems (Use notebook paper please)

Read this first. Most of you by now are pretty good at following example problems by plugging in a formula and chugging on the calculator to get an answer. Here is a page of problems designed to challenge you. As final exams might cause you to stop and sort through the information to select a formula to use, this worksheet is designed to force you to practice good problem solving techniques.

HINTS: Read the problem. Note the "givens" and the "find." Some information may be extraneous. Always check the units and sig figs..S ome may require a mole chapter refresher. SHOW WORK

Practice Problems	Formula(s)	Solution Notes
1. A gas at constant temperature occupies a volume of 2.40 dm^3 and exerts a pressure of 110 kPa. What volume will the gas occupy at a pressure of 79.5 kPa ?	(Boyle's Law) Pv = pV = k or $P_1V_1 = P_2V_2$	Given: Find: V_2= _ T = 0 K V_1= P_1 = P_2 =
2. What is the pressure of a gas that origninally occupied 3.95 dm^3 at a pressure of 48.73 kPa, if the volume is increased to 5.43 dm^3? Assume that temperature remains constant.		
3. At constant temperature, a gas that exerted a pressure of 1.44 atm and that occupied 1.58 dm^3 is compressed until its pressure is 6.29 atm. What is its final volume?		
4. A gas at constant pressure occupies 0.400 dm^3 at 50°C. What volume will it have at 300°C? (Hint: Remember to convert temperature to kelvins.)		
5. A gas occupies 0.105 dm^3 at 100 K. At what Celcius temperature will its volume be 0.140 dm^3? Assume pressure remains constant.		
6. At 75°C, a gas has a volume of 3.22 $dm^{3.}$ What volume will it occupy at 75 K?		
7. A gas at 300 K occupies 6.50 dm^3 at a pressure of 355 kPa. What will its pressure be at 250 K if its volume is reduced to 4.80 dm^3?		
8. At 120 °C, a gas exerts a pressure of 212 kPa when its volume is 0.495 dm^3. If the temperature is raised to 240 °C, at what volume will the gas exert a pressure of 183 kPa?		
9. A gas confined in a 515 cm^3 container exerts a pressure of 107.4 kPa at 38.6 °C. At what Celcius temperature will it exert a pressure of 635.7 kPa if it is placed into a 644 cm^3 container?		
10. A gas sample that has a mass of 7.02 g occupies 319 cm^3 at 54.3 °C , and a pressure of 87.4 kPa. Calculate the gas's density at STP. (273 K and 101.3 kPa)		

Practice Problems	Formula(s)	Solution Notes
11. At 225 K, a 1.00 g gas sample in a 1.88 dm^3 container exerts a pressure of 108.8 kPa. What would the gas sample's density be at 345 K in another container at a pressure of 68.3 kPa?		
12. Solid potassium chlorate ($KClO_3$) decomposes to produce solid potassium chloride (KCl) and oxygen gas (O_2) according to the balanced chemical equation: $2\ KClO_{3(s)} \rightarrow 2\ KCl_{(s)} + 3O2_{(g)}$ What volume of oxygen gas, measured at 40.0 ^oC and 85.4 kPa, will be produced when 13.5 g of potassium chlorate is decomposed? (K = 39.1 g/mol;Cl = 35.5 g/mol; O = 16 g/mol)		
13. Solid iron (II) chloride ($FeCl_2$) is decomposed to produce solid iron (Fe) and chlorine gas (Cl_2) according to the balanced chemical equation: $FeCl_{2(s)} \rightarrow Fe_{(s)} + Cl_{2(g)}$ What volume of chlorine gas, measured at 71.7 ^oC and 133 kPa, will be produced when 98.4 g of iron (II) chloride is decomposed? (Fe = 55.8 g/mol; Cl = 35.5 g/mol)		
14. A 441 dm^3 sample of nitrogen gas at a pressure of 88.3 kPa is placed into a container of equal volume that already holds hydrogen gas at a pressure of 125.6 kPa. What is the partial pressure of the nitrogen in the new container? What is the total pressure in the new container?		
15. Calculate the relative rates of diffusion of nitrogen gas (N_2) and hydrogen gas (H_2). (N= 14.0 amu; H = 1.0 amu)		
16. Calculate the relative rates of diffusion of methane gas (CH_4) and ammonia gas (NH_3). (C = 12.0 amu; H = 1.0 amu; N= 14.0 amu)		
17. Calculate the relative rates of diffusion of two gases A and B, given that their densities, under the same conditions of temperature and pressure, are 1.47×10^{-3} g/dm^3 and 7.33×10^{-3} g/dm^3.		
18 A sample gas occupies 30.8 dm^3 at a temperature of 325 K and a pressure of 149 kPa. Calculate the number of moles of the gas that are present. (Note: R = 8.31 kPa-dm^3/K-mol.)		
19. What pressure is exerted by 0.625 mole of a gas in a 45.4 dm^3 container at $^-24.0$ ^oC?		
20. At what Celcius temperature will 11.8 moles of gas exert 592 kPa of pressure in a container whose volume is 32.8 dm^3?		

