Gases and Solutions Test Review Sheet

Identify the gas laws that explain these situations (1-3).
1. A balloon pops after floating high into the atmosphere.

2. A balloon pops in a hot car on a summer day.

3. Do not store aerosol cans at temperatures above 120°F. Danger of explosion.

Identify the gas law and solve the problem (4-51).
4. Hydrogen gas is collected over water at 35°C to give a total pressure of 0.80 atm. Find the pressure of the dry hydrogen gas in kPa. (see p.899 for necessary data)

5. A jar is tightly sealed at 22°C and 772 torr. What is the pressure inside the jar after it has been heated to 178°C?

6. 300.0 mL of gas has a pressure 75.0 kPa. When the volume is decreased to 125.0 mL, what is its pressure?

7. Hydrogen diffuses 3.72 times faster than an unknown gas. Find the molar mass of the unknown gas.

8. 50.0 L of gas has a temperature of 75°C. What is the temp in Celsius when the volume changes to 110 L?

9. What is the volume of a container that holds 48.0 g of helium at a pressure of 4.0 atm and temperature of 52°C?

10. A gas occupies 325 L at 25°C and 98.0 kPa. What is its volume at 70.0 kPa and 15°C?

11. Define real gases. When do they act like ideal gases?

12. Explain Graham's law. How does molar mass affect the rate of diffusion?

13. Explain the effect of adding more solute to unsaturated, saturated, and supersaturated solutions.

14. Explain how temperature and pressure affect solubility.

15. How many grams of $AlCl_3$ are required to make a 2.25m solution in 30.0 g of water?

16. What volume of 12M HCl is needed to prepare 250 mL of 0.20M HCl?

17. Explain the difference in preparing solutions based on molarity versus molality.

18. Which will have the greatest effect on Δt_f at the same molality: $C_{12}H_{22}O_{11}$, $MgBr_2$, $AlCl_3$, or NH_4NO_3?

19. When 26.4 g of NaBr dissolves in 0.20 kg of water, what is the freezing point of the solution? (T_f= 1.86 for water)