

4. For each of the following situations, state whether energy is *released*, *absorbed*, or *unchanged*, and whether entropy *increases*, *decreases*, or *remains unchanged*.
- A tree grows in Brooklyn
 - Spelling words in a game of Scrabble
5. Household hydrogen peroxide is a 3% (w/v) solution of H_2O_2 in water. What is the molarity of the solution?
6. For each of the following compounds, state whether the intermolecular forces are primarily hydrogen bonding, permanent dipole, or temporary dipole.
- dinitrogen dihydride
 - CH_4O
 - O_3

7. At STP, a gaseous substance occupies a volume of 11.2 liters and has a mass of approximately 20 g. Which substance from the list below is the unknown gas.
- a. O₂
 - b. Ar
 - c. MgO
 - d. Ne₂
8. Copper metal reacts with nitric acid as shown in the equation below. If one mole of copper reacts with the acid, how many liters of NO₂ will be produced at a temperature of 25 °C and a pressure of 750 torr?



9. Three sealed flasks each have a volume of 1.0 L and a temperature of 25 °C. Flask A contains one mole of fluorine, Flask B contains one mole of bromine, and Flask C contains one mole of xenon.
- a. Which flask(s) now have the greatest total pressure? Explain your answer.

 - b. Which flask(s) now have the least total pressure? Explain your answer.