More Practice Problems for Thermal Physics Test

1. How many joules are needed to heat 20.0 kg of Al from 10oC to 50oC? **720 kJ**
2. A 0.050 kg piece of metal is heated to 100oC, then placed in a beaker containing 200.0 g of water at 10oC. The temperature of the water rises to 15oC. Calculate the specific heat of the metal. **984 J/kgK**
3. Determine the amount of heat required to completely vaporize a 25.0 g sample of water at 20°C. **64.9 kJ**
4. Dry ice is carbon dioxide (CO2, molar mass = 44 g/mol) in the solid state. 1.28 grams of dry ice is placed in a 5.00 L chamber that is maintained at 35.1°C. What is the pressure in the chamber after all of the dry ice has sublimed? **1.49 x 104 Pa or 14.9 kPa (NOTE: 1 L = 1 dm3 )**
5. A sample of oxygen gas occupies a volume of 0.250 dm3 at a pressure of 97.5 kPa. What volume will the gas occupy at a pressure of 115 kPa if temperature is held constant? **0.212 dm3**
6. A sample of nitrogen occupies a volume of 2.50 x 10-3 m3 at 25°C. What volume will it occupy at 95°C? **3.09 x 10-3 m3**
7. A sample of gas has a volume of 2.56 x 10-4 m3 at 9.50 x 104 Pa and 25°C. What pressure will the gas exert at 50.°C and 2.45 x 10-4 m3? **1.076 x 105 Pa or 107.6 kPa**
8. Determine the value of the root mean square velocity for a particle of xenon gas at 298 K. **238 m/s**
9. What is the internal energy of the helium (Molar mass = 4 g/mol) in a party balloon if it is filled with 25.0 g of gas and is in a 22.0°C room? **23.0 kJ**