Quiz Chapter 6

1. (2 points) The SI unit for energy is_____ and it is abbreviated_____.

2. (2 points) I have a system that absorbs 61 kJ of heat from the surroundings but performs 15 kJ of work on the surroundings. What is the internal energy of the system ?

3. (2 points) The volume of an ideal gas is increased from 50 mL to 10L while the pressure is kept constant at 5 atm. How much work is associated with this process?

4. (1 point) The last step in the production of sulfuric acid uses the reaction $SO_3(g) + H_2O(l) \rightarrow H_2SO_4(aq)$. The enthalpy change for this reaction is -227 kJ. Do you need to cool this reaction or heat it?

5. (2 points) The burning of propane has a ΔH of -2221kJ per mole of propane. How much propane do I need to burn to generate 10 MJ of heat?

6. (3 points) The heat capacity of aluminum is 0.9 $J/^oC \cdot g$. If I am going to make pancakes, how much energy does it take to raise the temperature of a 2 kg griddle from 23^oC to 200^0C?

6. I have a constant pressure calorimeter filled with 150 g of water. In this calorimeter I run a chemical reaction and the temperature of the water drops form 24.3^{o}C to 21.7^{o}C. (The heat capacity of water is 4.18 J/^{o}C$\cdot$g)

A. (1 point) What type of energy do I measure with this calorimeter?

B. (3 points) What is the energy of this reaction?

7. (4 points) I have a 10 g block of aluminum heated to 90^{o}C and 100 g water that is sitting at 23^{o}C. If I put the aluminum block in the water, how warm does the water get? (The heat capacity of water is 4.18 J/^{o}C$\cdot$g and that of aluminum is 0.89 J/^{o}C$\cdot$g)