**Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Energy Worksheet**

**Magnet Chemistry**

1. Gasahol, a mixture of ethyl alcohol and gasoline, has been proposed as a fuel to help conserve our petroleum resources. It is available on a limited basis. The thermochemical equation for the burning of ethyl alcohol is

C2H5OH(*l*) + 3 O2(*g*) → 2 CO2(*g*) 3 H2O(*l*) ΔH = -1366.8 kJ

Calculate the enthalpy change observed when burning 2.00 g ethyl alcohol.

2. When 7.11 g NH4NO3 is added to 100 mL water, the temperature of the calorimeter contents declines from 22.1 ºC to 17.1 ºC. Assuming the mixture has the same specific heat as water and a mass of 107 g, calculate the heat *q*. Is the dissolution of ammonium nitrate exothermic or endothermic?

3. How much energy is required to raise the temperature of 50.00 mL of water from 25.52 ºC to 28.75 ºC? (The density of water at this temperature is 0.997 g/mL)

4. Isooctane (2,2,4-trimethylpentane), one of the many hydrocarbons that make up gasoline, burns in air to give water and carbon dioxide.

2 C8H18(*l*) + 25 O2(*g*) → 16 CO2(*g*) + 18 H2O(*l*) ΔH = -10,922 kJ

What is the enthalpy change if you burn 1.00 L of isooctane (density = 0.69 g/mL)?

5. The enthalpy change when 1 mole of methane (CH4) is burned is -890 kJ. It takes 44.0 kJ to vaporize 1 mole of water. What mass of methane must be burned to provide the heat needed to vaporize 1.00 g water?