

# Example Systems and Scale Explanations Handout

## **Ethanol**

- A. When the ethanol burns, the molecules that it takes go through chemical change and turns into different molecules. The ethanol transforms into  $\text{H}_2\text{O}$ . When it burns it creates heat, light, and motion. The number of atoms and energy never change.
  
- B. When ethanol burns, the ethanol has a chemical change called combustion. The ethanol and oxygen molecules enter the flame and are rearranged into carbon dioxide and water. The high energy bonds in the ethanol molecules start as chemical energy and are then transformed into heat and light energy. The carbon dioxide and water leave the flame and enter the air. The atoms and energy last forever, and there is the same number of atoms and energy before and after the change.

## **Methane**

- A. So first the oxygen and methane enter the flame and then the  $\text{CH}_4 + 2\text{O}_2$  are broken down into  $\text{CO}_2$  and  $2\text{H}_2\text{O}$ . Then, as the flame burns, chemical energy gets transformed into heat and light energy. After the change, the heat energy, light energy,  $\text{CO}_2$ , and  $2\text{H}_2\text{O}$  leave and go into the air
  
- B. When the methane is burning,  $\text{CO}_2$  and  $\text{H}_2\text{O}$  are leaving the methane, but oxygen is going into the methane. The forms of energy that come out are heat and light. At first there is chemical energy, then when the flame begins, it gives heat and light, which is combustion.