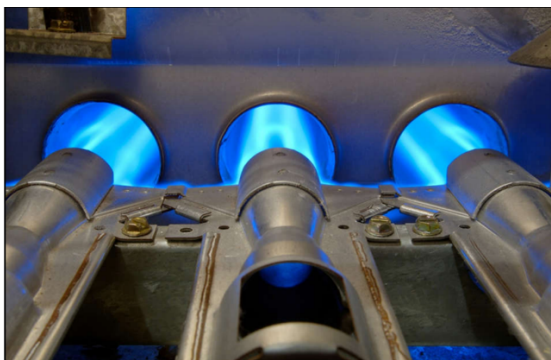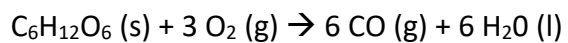Incomplete combustion...                    Complete combustion...
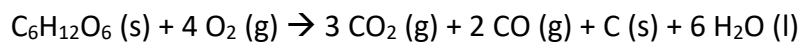


The products of incomplete combustion are $CO_2$ (g), CO (g), and C (s).

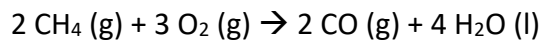**Wood/sugar**

$C_6H_{12}O_6$ (s) + 3 $O_2$ (g) → 6 CO (g) + 6 $H_2O$ (l)

$\Delta H_{comb}$ =

$C_6H_{12}O_6$ (s) + 4 $O_2$ (g) → 3 $CO_2$ (g) + 2 CO (g) + C (s) + 6 $H_2O$ (l)

**Methane**

2 $CH_4$ (g) + 3 $O_2$ (g) → 2 CO (g) + 4 $H_2O$ (l)

$\Delta H_{comb}$ =

4 $CH_4$ (g) + 5 $O_2$ (g) → 2 CO (g) + 8 $H_2O$ (l) + 2C (s)

**Propane**

$$2 \ C_3H_8 \ (g) + 7 \ O_2 \ (g) \rightarrow \qquad \qquad 6 \ CO \ (g) + 8 \ H_2O \ (l)$$
$$C_3H_8 \ (g) + 4 \ O_2 \ (g) \rightarrow \quad CO_2 \ (g) + 2 \ CO \ (g) + 4 \ H_2O \ (l)$$
$$2 \ C_3H_8 \ (g) + 9 \ O_2 \ (g) \rightarrow 4 \ CO_2 \ (g) + 2 \ CO \ (g) + 8 \ H_2O \ (l)$$
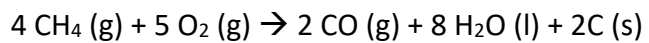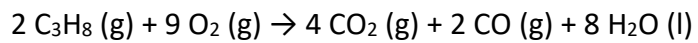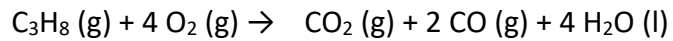
**Problem:**

Brad's "home heating system" question...I collect ½ gal of water per day when the outside temperature is ~50 °F (10 °C).

a) how much natural gas (ie. methane) do i consume per day?

b) how much heat was required to keep my home at 68 °F (20 °C)?