06/14/22

Using the following information, determine the $\Delta_{rxn}H°$ for $CH_4(g) + H_2O(l) \rightarrow CO(g) + 3\ H_2(g)$

$2\ CO(g) + O_2(g) \rightarrow 2\ CO_2(g)$ $\Delta_{rxn}H° = -566$ kJ/mol•rxn
$2\ H_2(g) + O_2(g) \rightarrow 2H_2O(l)$ $\Delta_{rxn}H° = -570$ kJ/mol•rxn
$CO_2(g) + 2\ H_2O(l) \rightarrow CH_4(g) + 2\ O_2(g)$ $\Delta_{rxn}H° = +890$ kJ/mol*rxn

How much energy is required to make 10 kg of H_2 (g)

Assume that coal is pure carbon. Write the balanced chemical equation for the burning of coal.

How many joules of heat can be generated when 100 pounds of coal is burned? The $\Delta_f H°$ of H_2O (l) = -285 kJ/mol and the $\Delta_f H°$ of CO_2 (g) = -393 kJ/mol

How many kilograms of CO_2 will be produced in this process?

Write the balanced equation for the combustion of natural gas - CH_4 (g)

How many joules of heat can be generated when 100 pounds of natural gas is burned? The $\Delta_f H°$ of H_2O (l) = -285 kJ/mol, the $\Delta_f H°$ of CO_2 (g) = -393 kJ/mol and the $\Delta_f H°$ of CH_4 (g) = -74 kJ/mol.

How many kilograms of CO_2 will be produced in this process?

Compare coal to natural gas

Consider the combustion of gasoline C_8H_{18}.

Write the balanced chemical equation for this process

You combust 2.8 grams of gasoline in a calorimeter that contains 2.00 L of water and the temperature of the water increases by 15.97 °C. The $\Delta_f H°$ of H_2O (l) = -285 kJ/mol and the $\Delta_f H°$ of CO_2 (g) = -393 kJ/mol. What is the $\Delta_f H°$ of C_8H_{18}?