South Pasadena • AP Chemistry Name _____
Period ___ Date ___/___/___

6 • Energy & Chemical Thermodynamics

PRACTICE TEST

$$C_2H_{2(g)} + 2\ H_{2(g)} \rightarrow C_2H_{6(g)}$$

Information about the substances involved in the reaction represented above is summarized in the following tables.

Substance	$\Delta H°_f$ (kJ/mol)
$C_2H_{2(g)}$	226.7
$C_2H_{6(g)}$	-84.7

(a) Write the equation for the heat of formation of $C_2H_6(g)$

(b) Use the above information to determine the enthalpy of reaction for the equation given.

$$C_6H_5OH_{(s)} + 7\ O_{2(g)} \rightarrow 6\ CO_{2(g)} + 3\ H_2O_{(l)}$$

When a 2.000-gram sample of pure phenol, $C_6H_5OH_{(s)}$, is completely burned according to the equation above, 64.98 kilojoules of heat is released. Use the information in the table below to answer the questions that follow.

Substance	Standard Heat of Formation, $\Delta H°_f$; at 25°C (kJ/mol)
$CO_{2(g)}$	-393.5
$H_2O_{(l)}$	-285.85
$C_6H_5OH_{(s)}$	?

(a) Calculate the **molar** heat of combustion of phenol in kilojoules per mole at 25°C.

(b) Calculate the standard heat of formation, $\Delta H°_f$, of phenol in kilojoules per mole at 25°C.