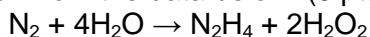


CHEM 130
Quiz 7 – October 27, 2017

Name _____

Complete the following problems. Write your final answers in the blanks provided.

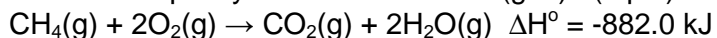
1. Determine the ΔH° for this reaction from the data below. (8 pts)



Reaction	ΔH°
$\text{N}_2\text{H}_4 + \text{O}_2 \rightarrow \text{N}_2 + 2\text{H}_2\text{O}$	-622.2 kJ
$\text{H}_2 + \frac{1}{2}\text{O}_2 \rightarrow \text{H}_2\text{O}$	-285.8 kJ
$\text{H}_2 + \text{O}_2 \rightarrow \text{H}_2\text{O}_2$	-187.8 kJ

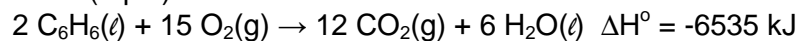
Answer _____

2. You are planning to deep fry some Oreos by heating cooking oil in a pan on a natural gas stove. Your source of heat will be the combustion of natural gas (methane, molar mass 16.04 g/mol), shown below. What mass of methane must burn to heat 2.02 kg of cooking oil from 72°F (22.2°C) to 375°F (190.6°C) to make some delicious treats? The specific heat capacity of the cooking oil is 1.75 J/(g°C), the specific heat capacity of water is 4.184 J.(g°C). (9 pts)



Answer _____

3. The overall reaction for the combustion of benzene (C₆H₆) is shown below. Use the data in the table at the right to calculate ΔH_f° of benzene. (8 pts)



Substance	ΔH_f° (kJ/mol)
C(g)	+716.7
C(graphite)	0
CO(g)	-110.5
CO ₂ (g)	-393.5
H(g)	+218.0
H ₂ (g)	0
H ₂ O(g)	-241.8
H ₂ O(ℓ)	-285.8
O(g)	+249.2
O ₂ (g)	0
O ₃ (g)	+142.7

Answer _____

Possibly Useful Information

$\text{KE} = \frac{1}{2}mv^2$	$\text{K} = ^\circ\text{C} + 273.15$	$q_{\text{lost}} = -q_{\text{gained}}$
$q = mc\Delta T$	$q = n_{\text{LR}}\Delta H_{\text{rxn}}$	$q = m\Delta H$