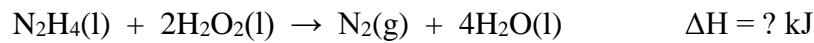


CHEM 1105 TEST#1

NAME:
Student Number:

Date: July 4, 2016

1. Using Hess's law calculate ΔH for the reaction



Given these reactions and their ΔH 's.

- | | |
|---|--------------------------------|
| 1. $\text{N}_2\text{H}_4(\text{l}) + \text{O}_2(\text{g}) \rightarrow \text{N}_2(\text{g}) + 2\text{H}_2\text{O}(\text{l})$ | $\Delta H = -622.2 \text{ kJ}$ |
| 2. $2\text{H}_2\text{O}(\text{l}) \rightarrow 2\text{H}_2(\text{g}) + \text{O}_2(\text{g})$ | $\Delta H = +571.6 \text{ kJ}$ |
| 3. $\text{H}_2\text{O}_2(\text{l}) \rightarrow \text{H}_2(\text{g}) + \text{O}_2(\text{g})$ | $\Delta H = +187.8 \text{ kJ}$ |

2. Use the given standard enthalpies of formation values to calculate ΔH° for the following:
 $2\text{Fe}_2\text{O}_3(\text{s}) + 3\text{Si}(\text{s}) \rightarrow 3\text{SiO}_2(\text{quartz}) + 4\text{Fe}(\text{s}) \quad \Delta H^\circ = ?$

Compound	ΔH_f° (kJ/mole)
Fe(s)	0
Fe ₂ O ₃ (s)	-824.2
Si(s)	0
SiO ₂ (quartz)	-910.9

3. A 0.828 g sample of gasoline is burned in a bomb calorimeter with a heat capacity of 9.89 kJ/°C. The temperature in the calorimeter rises from 22.75 °C to 26.37°C. Calculate the heat of combustion of gasoline, in kilojoules per gram.

$$-\mathbf{q}_{\text{rxn}} = \mathbf{q}_{\text{cal}} \quad \mathbf{q}_{\text{cal}} = C_{\text{cal}} \Delta t$$

Answer Set for CHEM 1105 TEST#1

1. -818.2 kJ

2. -1085 kJ

3. -43.2 kJ/g