Self Assessment B

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This assignment is due on January 27 2012, 12:45 PM EST.

Question 1

An endothermic process

- **A)** raises the temperature of one gram of a substance by one degree Celcius.
- **B)** takes in heat from the surroundings.
- **C)** increases the acidity of the surroundings.
- **D)** gives off heat to the surroundings.
- **E)** releases carbon dioxide into the surroundings.

Question 2

The chemical equation describing the conversion of SO_2 into SO_3 is shown below. Calculate ΔH^o when 89.6 g of SO_2 is converted into SO_3.

$SO_2(g) + \frac{1}{2}O_2(g) \text{ ----> } SO_3(g)$ $\Delta H^o_{rxn} = -99.1$ kJ

- **A)** -69.3 kJ
- **B)** -139 kJ
- **C)** 69.3 kJ
- **D)** 139 kJ
- **E)** -111 kJ

Question 3

How much energy in calories is required to heat 25.0 g of platinum (specific heat capacity = 0.032 cal/g.K) from 24.5 ^oC to 75.0 ^oC?

- **A)** 48 cal
- **B)** 20. cal
- **C)** 80 cal
- **D)** 40. cal
- **E)** None of the above.

Question 4

If a substance has a specific heat capacity of 1.0 J/g·^oC and a density of 2.0 g/mL, how much energy would be required to raise the temperature of 100 mL of the substance from 25 to 45 ^oC?

- **A)** 0.20 kJ
- **B)** 2.0 kJ
- **C)** 4 kJ
- **D)** 8 kJ

Question 5

A 0.468-g sample of pentane (C_5H_{12}) was burned in a bomb calorimeter. The temperature of the calorimeter and the 1.00 kg of water rose from 20.45 to 23.65 ^oC. The specific heat capacity of the calorimeter is 2.21 kJ/ ^oC, and the specific heat capacity of water is 4.184 J/g·^oC. What is the heat of combustion of one mole of C_5H_{12}?

- **A)** -7.07×10^3 kJ/mol
- **B)** -2.05 kJ/mol
- **C)** -3.16×10^3kJ/mol
- **D)** 1.34×10^4 kJ/mol
- **E)** 3.16×10^3 kJ/mol

Question 6

Calculate the standard heat of formation of carbon disulfide (CS_2) from its elements, $C(s) + 2\ S(s) \text{ ----> } CS_2(l)$, given that:

$C(s) + O_2(g) \text{ ----> } CO_2(g)$, $\Delta H = -393.5$ kJ;

$S(s) + O_2(g) \text{ ----> } SO_2(g)$, $\Delta H = -296.8$ kJ; and

$CS_2(l) + 3\ O_2(g) \text{ ----> } CO_2(g) + 2\ SO_2(g)$, $\Delta H = -1076.8$ kJ.

- **A)** -1767.1 kJ
- **B)** -386.5 kJ
- **C)** 89.7 kJ
- **D)** 386.5 kJ
- **E)** None of the above

Question 7

For which of the substances below is $\Delta H^o_f = 0$?

- **A)** $O_2(g)$
- **B)** $N_2(l)$
- **C)** Na(g)