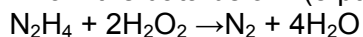


Quiz 7 – October 28, 2016

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. In a constant-pressure calorimeter, 55.0 mL of 0.680 M $\text{Ba}(\text{OH})_2$ was added to 55.0 mL of 0.680 M HCl. The reaction caused the temperature of the solution to rise from 21.97°C to 26.60°C. If the solution has the same density and specific heat as water (1.00 g/mL and 4.184 J/g·°C, respectively), what is ΔH for this reaction (per mole of H_2O produced)? Assume that the total volume is the sum of the individual volumes. (9 pts)

Answer _____

3. The overall reaction that occurs in the photosynthesis of plants is

$$6\text{CO}_2(\text{g}) + 6\text{H}_2\text{O}(\text{g}) \rightarrow \text{C}_6\text{H}_{12}\text{O}_6(\text{s}) + 6\text{O}_2 \quad \Delta H^\circ = +2803 \text{ kJ}$$
 Determine the standard enthalpy of formation for glucose, $\text{C}_6\text{H}_{12}\text{O}_6(\text{s})$. (8 pts)

Answer _____

Possibly Useful Information

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

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

1 1A	2 2A	3 3B	4 4B	5 5B	6 6B	7 7B	8	9	10	11	12	13 3A	14 4A	15 5A	16 6A	17 7A	18 8A
¹ H 1.00794	⁴ Be 9.01218	¹² Mg 24.3050	²² Ti 47.88	²³ V 50.9415	²⁴ Cr 51.9961	²⁵ Mn 54.9381	²⁶ Fe 55.847	²⁷ Co 58.9332	²⁸ Ni 58.693	²⁹ Cu 63.546	³⁰ Zn 65.39	¹³ Al 26.9815	¹⁴ Si 28.0855	¹⁵ P 30.9738	¹⁶ S 32.066	¹⁷ Cl 35.4527	² He 4.00260
³ Li 6.941	¹¹ Na 22.9898	²¹ Sc 44.9559	⁴⁰ Zr 91.224	⁴¹ Nb 92.9064	⁴² Mo 95.94	⁴³ Tc (98)	⁴⁴ Ru 101.07	⁴⁵ Rh 102.906	⁴⁶ Pd 106.42	⁴⁷ Ag 107.868	⁴⁸ Cd 112.411	³¹ Ga 69.723	³² Ge 72.61	³³ As 74.9216	³⁴ Se 78.96	³⁵ Br 79.904	¹⁰ Ne 20.1797
¹⁹ K 39.0983	³⁷ Rb 85.4678	³⁹ Y 88.9059	⁷² Hf 178.49	⁷³ Ta 180.948	⁷⁴ W 183.84	⁷⁵ Re 186.207	⁷⁶ Os 190.23	⁷⁷ Ir 192.22	⁷⁸ Pt 195.08	⁷⁹ Au 196.967	⁸⁰ Hg 200.59	³¹ Ga 69.723	³² Ge 72.61	³³ As 74.9216	³⁴ Se 78.96	³⁵ Br 79.904	³⁶ Kr 83.80
⁵⁵ Cs 132.905	⁸⁷ Fr (223)	⁵⁷ *La 138.906	¹⁰⁴ Rf (261)	¹⁰⁵ Db (262)	¹⁰⁶ Sg (266)	¹⁰⁷ Bh (264)	¹⁰⁸ Hs (277)	¹⁰⁹ Mt (268)	¹¹⁰ Ds (271)	¹¹¹ Rg (272)	⁸¹ Tl 204.383	⁸² Pb 207.2	⁸³ Bi 208.980	⁸⁴ Po (209)	⁸⁵ At (210)	⁸⁶ Rn (222)	⁵⁴ Xe 131.29
⁸⁹ *Ac 227.028	⁸⁸ Ra 226.025																
*Lanthanide series																	
†Actinide series																	
				⁵⁸ Ce 140.115	⁵⁹ Pr 140.908	⁶⁰ Nd 144.24	⁶¹ Pm (145)	⁶² Sm 150.36	⁶³ Eu 151.965	⁶⁴ Gd 157.25	⁶⁵ Tb 158.925	⁶⁶ Dy 162.50	⁶⁷ Ho 164.930	⁶⁸ Er 167.26	⁶⁹ Tm 168.934	⁷⁰ Yb 173.04	⁷¹ Lu 174.967
		⁹⁰ Th 232.038	⁹¹ Pa 231.036	⁹² U 238.029	⁹³ Np 237.048	⁹⁴ Pu (244)	⁹⁵ Am (243)	⁹⁶ Cm (247)	⁹⁷ Bk (247)	⁹⁸ Cf (251)	⁹⁹ Es (252)	¹⁰⁰ Fm (257)	¹⁰¹ Md (258)	¹⁰² No (259)	¹⁰³ Lr (262)		

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