**Answers to Review Questions pg. 350 #2-10,14-18**

2. c 3. d

4. m = 10.0 g, ∆T = 1.00 °C

Q = mc∆T

= 10.0 g × 4.19 J/g · °C × 1.00 °C

= 41.9 J

The correct answer is b.

5. The mass of the sample does not affect the answer.

C = 2.337 kJ/°C ∆T = 3.03 °C

Q = C∆T

= 2.337 kJ/°C × 3.03 °C

= 7.08 kJ

The correct answer is b.

6. % efficiency = 40.0 kJ/50.0 kJ × 100% = 80.0%
The correct answer is c.

7. e

8. Reverse equation (1) and add equation (2) to it.

Cancel compounds found on opposite sides of the equations.

-1(1) A + 2C → AC2 ∆H° = -50 kJ

(2) AC2 + B → BC2 + A ∆H° = -20 kJ

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2C + B → BC2 ∆H° = -70 kJ

The correct answer is a.

9. e

10. It takes 31.8 kJ to decompose 1 mol of Ag2S.

Find the number of moles. n = m/M

M = 2 × 107.868 g/mol + 32.065 g/mol = 247.801 g/mol

n = 123.9 g x 1 mol/247.801 g = 0.5000 mol

Q = n∆Hr

= 0.5000 mol × 31.8 kJ/mol

= 15.9 kJ

The correct answer is a.

14. nAlCl3 = 6.85 g x 1 mol/133.341 g = 0.051372 mol

∆H° = n∆Hsoln

= 0.051372 mol × (-373.8 kJ/mol)

= -19.2029 kJ

Heat absorbed by water = 19.2029 kJ = 19 202.9 J

Q = mc∆T

19 202.9 J = 255.0 g × 4.19 J/g°C × ∆T

∆T = 17.973°C

Tf - Ti = 17.973°C

48.7°C - Ti = 17.973°C

Ti = 30.7°C

15. I2(s) + 20.85 kJ → I2(l)

16. ∆H ̊r = [∑(n∆H ̊f products)] - [∑(n∆H ̊f reactants)]

∆H ̊r = [(1 mol)(∆H ̊f C2H2(g)) + (1 mol)(∆H ̊f Ca(OH)2(s))] - [(1 mol)(∆H ̊f CaC2(s)) + (2 mol)(∆H ̊fH2O(l))]

-128.0 kJ = [(1 mol)( 227.4 kJ/mol) + (1 mol)(–985.2 kJ/mol)] - [(1 mol)(∆H ̊f CaC2(s)) + (2 mol)(-285.8 kJ/mol)]

∆H ̊f CaC2(s) = -58.2 kJ/mol

17. ∆Hneutralization = -55.31 kJ/mol of HNO3(aq)

n(HNO3(aq)) = 0.0500 mol/L × 0.400 L = 0.0200 mol

∆Hneut = Q/n

-55.31 kJ = Q/0.020 0 mol

Q = 1.1062 kJ = 1106.2 J

Heat absorbed by solutions:

Qsoln = 1 106.2 J = mc∆T

∆T = 19.00°C - 18.67°C = 0.33°C

1106.2.J = m × 4.19 J/g°C × 0.33°C

Total mass of solutions = m = 800.028 9 g = 800.0 g

Total volume of solutions = 800.0 g × 1.000 g/mL = 800.0 mL

Volume of KOH solution = 800.0 mL - 400.0 mL = 400.0 mL

18. (1) × -1/2: 2NO(g) + 3/2 O2(g) → N2O5(g) ∆H = -223.7 kJ

(2) × -1: 2NO2(g) → 2NO(g) + O2(g) ∆H = 114.2 kJ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2NO2(g) + O2(g) → N2O5(g) ∆Hr = -109.5 kJ