Name_____Key_____

1. Give the name of the following polyatomic ions: **(4 pts)**

   a. NH_4^{1+} b. NO_3^{1-} c. $C_2H_3O_2^{1-}$ d. CN^{1-}

   ammonium nitrate acetate cyanide

2. Solve the following heat problems: **(16 pts)**

   S.H.$_1$ x mass$_1$ x $|\Delta T_1|$ = S.H.$_2$ x mass$_2$ x $|\Delta T_2|$

   heat = S.H x mass X ΔT

   a. 225.0 mL of water at a temperature of 86.0°C are combined with 115.0mL of water at a temperature of 18.0°C. What is the final temperature of the mixture? The density of water is 1.00 g/mL (**Hint:** because you are mixing water with water the S.H. cancels out on both sides and you don't need to use it)

   $$mass_1 \times |\Delta T_1| = mass_2 \times |\Delta T_2|$$
   $$225.0mL \times (86.0 - Tf) = 115.0 (Tf - 18.0)$$
   $$19350 - 225Tf = 115Tf - 2070$$
   $$21420 = 340Tf \qquad Tf = 63.0°C$$

   b. 21.3 grams of an unknown metal are heated to 161 degrees Celsius and dropped into 38.4 grams of water initially at 81.3 degrees Celsius. The temperature of the equilibrium mixture is 87.4 degrees Celsius. Find the specific heat of the unknown metal.

   $$S.H._1 \times 21.3g \times (161 - 87.4) = \left(4.184 \frac{J}{g°}\right)(38.4)(87.4 - 81.3)$$

   $$S.H._1 \times 21.3g \times \underset{(2\ s.f.)}{73.6} = (4.184)(38.4)(6.1)$$

   $$S.H._1 = \frac{(4.184)(38.4)(6.1)}{(21.3)(73.6)} = 0.625 J/g°$$

   $$= \underline{\underline{0.63 J/g°}}$$