# Answer on Question #55940 - Chemistry - General chemistry

**Question:**

a 5.0g sample of an ionic compound (MW=96.5g/mol) is placed in 50.0g of water at 25C and the solution is stired. When the salt is completely dissolved the temperature of the solution is 32.7C

a) if we assume that the specific heat of the solution is 1.0cal/g, calculate the *triangle-Hsoln* for this compound in Kcal/g and in Kcal/mol

**Answer:**

$$Q = -\Delta H;$$

$$\Delta H_{soln} = -Q = -\frac{cm(T_2 - T_1)}{m_{sample}} = -\frac{1.0\frac{cal}{g} \times (5.0\ g + 50.0\ g)(32.7\ °C - 25°C)}{5.0\ g} = 84.7\frac{cal}{g}$$
$$\approx \boldsymbol{85\ cal/g}$$

$$\Delta H_{soln} = -Q = -\frac{cm(T_2 - T_1)}{n_{sample}} = -\frac{cmMW_{sample}(T_2 - T_1)}{n_{sample}}$$

$$= -\frac{1.0\frac{cal}{g} \times (5.0\ g + 50.0\ g) \times 96.5\frac{g}{mol} \times (32.7\ °C - 25°C)}{5.0\ g} = 8173.55\frac{cal}{mol}$$
$$\approx \boldsymbol{8.2\ kcal/mol}$$