The standard deviation of a data set is a measure of the “spread” of a distribution of data or other numerical values; it is a measure of variability within a particular data set. To calculate standard deviation of a sample, generally the variance of the sample is first calculated. The variance is the average squared deviation of each number from its mean and is given in the following equation:

02 = E(x – u)2

N – 1 where u is the mean and N is the number of values within the data set of interest. For example, for the data set 1, 2, and 3 the mean is 2 and the variance is given by the following:

O2 = (1 – 2)2+(2-2)2 + (3-2)2

2

The standard deviation of a sample is simply the square root of the variance, and is probably the most commonly measure of data “spread”.

For this exercise:

1. Calculate the standard deviation for the experimentally obtained values of Keq, Delta H and the values calculated for Delta G and Delta S. Calculate the standard deviation for those same values
2. Compare your values data set with the following accepted values as reported by Pickering 1987 shown in the table below:

Variable Value

Delta H/kJ mol-1 17.6 + 7.2

Delta G/kJmol-1 -5.77 + 0.63

Delta S/J mol-1 K-1 77.0 + 28

QUESTIONS:

How do your values compare to these experimentally obtained values?

What are some possible sources for error in your measurement?

Were there any extreme outliers in the data set you analyzed that might affect the pooled values?