Chem M3LC - UC Irvine
Robert Corn - Spring Quarter 2015

T-test for the Comparison of Two Experimental Means

Consider two measurements, A and B:

Expt A:
Number of data points: N_A
Mean: x_A
Std. Dev : s_A

Expt B:
Number of data points: N_B
Mean: x_B
Std. Dev : s_B

Are the two means statistically different?

1) Calculate the pooled standard deviation (s_P):

Total DOF: $N_A + N_B - 2$

$$s_P = \sqrt{\frac{\sum_{i=1}^{N_A}(x_i - x_A)^2 + \sum_{j=1}^{N_B}\left(x_j - x_B\right)^2}{N_A + N_B - 2}}$$

2) Calculate a t-value (t_{calc}) using the equation:

$$t_{calc} = \frac{|x_A - x_B|}{s_P}\sqrt{\frac{N_A N_B}{N_A + N_B}}$$

3) Compare with t value in the 95% table for the total DOF (t_{table}).

If $t_{calc} > t_{table}$, then the two numbers are statistically different (95% C. L.).

See the Argon spreadsheet for an example.