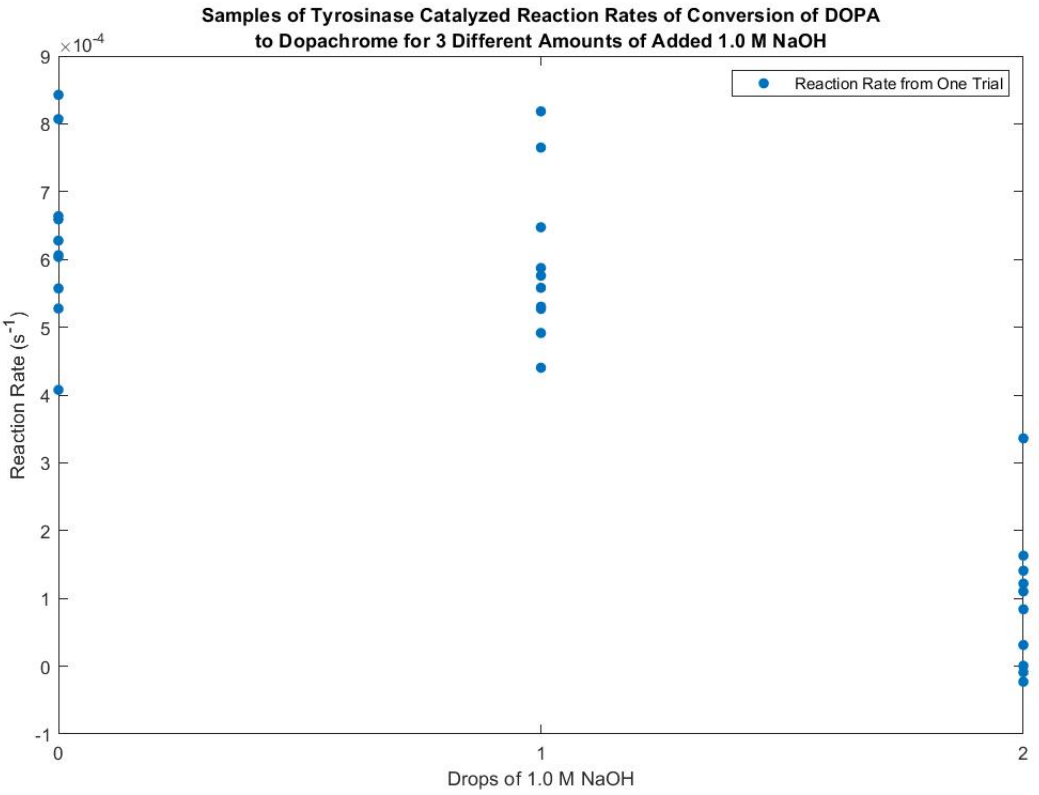
Figure 1



Pictured are samples of tyrosinase catalyzed reaction rates of the conversion of DOPA to dopachrome for three different amounts of added 1.0 M NaOH, namely 0, 1, and 2 drops of 1.0 M NaOH, with the 0-drop sample constituting the control group. The term "drops" will be used in the following as a shorthand for "drops of 1.0 M NaOH". To generate these values, first the spectrophotometers were calibrated with a blank of a solution of 900 μL of Pi buffer, 150 μL of mushroom tyrosinase enzyme, and 150 μL of dH_2O. Then, for each number of drops $n \in \{0, 1, 2\}$, for each trial, a cuvette was filled with a solution of 900 μL of Pi buffer, 150 μL of DOPA, 150 μL of mushroom tyrosinase enzyme, *n* drops of 1.0 M NaOH, and 10 – *n* drops of dH_2O. For each of our own trials, we collected the solution's light absorbance at 472.4 nm for 400 seconds, and then we recorded the slope of the best fit line over the support of the most linearly appearing portion of the data. The slope was reported as the reaction rate in s^{-1}, the rationale for this being that the change in absorption over time is monotonically related to the rate of the reaction of interest.

This data was collected to test the hypothesis that the addition of 1.0 M NaOH would decrease the reaction rate, and this could be observed through a decrease in the slope of the best fit line. The independent variable was drops of 1.0 M NaOH, the dependent variable was reaction rate, and the control variables included the solution's volume, the volumes of the buffer, the enzyme, and DOPA, the observation time, and the equipment. An important variable that was not controlled was the scanning wavelength, the reason being that the ten trials for each number of

drops were aggregated from five groups of two trials, one from each lab group, and each group had a different value for the scanning wavelength. The control group was the sample taken at 0 drops.

These data appear in support of the hypothesis. The effect of the buffer can be observed in that the reaction rate changed very little from 0 drops to 1 drop, but drastically decreased from 1 drop to 2 drops. Qualitatively, the variance of each sample appears large; this may be due to the difference in scanning wavelengths from group to group. An improvement to this experiment would be to do all of the measurements with one scanning wavelength.