Experiment 4: Analysis of an Acid-Base Titration Curve-The Gran Plot
Grading Rubrics for entire class

- **Notebook** (brief descriptions of what you did, specific observations, and good notebook mechanics (page numbers and dates) *(out of 5)*:
  - 1 missing plot  1 missing datum

- **Data Analysis** *(out of 15)*
  - Theoretical equivalence point?
  - Plot all of the data from your titration?
  - First derivative plot from your titration?
  - Indicator [OH-]?  1 missing or wrong
  - First derivative [OH-]?
  - Discussion of formal *(i.e. 0.1000 M)*, phenolphthalein-based, and first-derivative-based concentrations?  1 no discussion of $F_{\text{OH}^-}$  2 no discussion at all (or confused discussion)
  - Preliminary Gran plot?
  - Final Gran plot?
  - Gran plot endpoint?
  - LINEST in spreadsheet?
  - Ionic strength?  1 wrong
  - Activity coefficients for HP- and P2-?  1 wrong
  - Acid ionization constant?  1 wrong
  - Standard error in $K_a$?  1 wrong
  - 95% confidence interval for $K_a$?  1 wrong value of $k$
  - Case 1 t-test?
  - Comment on systematic error?  1 if vague, no discussion of factors that would affect $K_a$ (as opposed to $K_e$)

- **Accuracy and Precision of Results** *(out of 5)*
  - 1 high [OH-]

**TOTAL** *(out of 25)*