CHAPTER 17	**Thought Lab 17.1: Analyzing a Weak Acid-Strong Base Titration**	**BLM 17.4.3**
HANDOUT		

A student used a pH meter to collect data for the titration of ethanoic acid having an unknown concentration with a 0.150 mol/L solution of sodium hydroxide. The data table from the experiment is shown below.

The Titration of Ethanoic Acid with Sodium Hydroxide

Volume of Ethanoic acid = 25.00 mL

$[NaOH(aq)] = 0.150$ mol/L

Volume of NaOH(aq) added (mL)	pH
None	2.83
2.00	3.84
4.11	4.20
7.98	4.64
11.95	5.03
14.08	5.27
16.05	5.61
17.00	5.90
17.21	6.00
17.39	6.09
17.62	6.23
17.99	6.74
18.18	8.80
18.39	10.92
18.80	12.24
20.00	12.56
22.03	12.69

Procedure

1. Enter the data from the table into a spreadsheet program. Use the program to plot the results, with pH on the vertical axis and volume of base added on the horizontal axis. Make sure you enter labels for each axis, and provide a suitable title for your graph. Print your graph.

2. On your graph, shade the buffer region. Identify the pH range of an indicator suitable for this titration. Name two indicators that would have endpoints suitable for this titration.

3. The titration curve should show a steep change in pH near the equivalence point. Choose a point halfway along the portion of rapid change on the graph. Label this the equivalence point.

Analysis

1. From your graph, find the pH and volume of base added at equivalence.

2. Calculate the concentration of the ethanoic acid solution.

3. Explain why the pH at equivalence is not 7, the pH of neutral water.

4. What ions and molecules are in solution well before the equivalence point, such as at 10 mL of base added? How does this compare with the solution well after the equivalence point, such as at 20 mL of base added?