CHAPTER 8	**Thought Lab 8.2: Plotting a Titration Curve**	BLM 8.3.7
HANDOUT		

A student carried out the titration of 50.00 mL of aqueous potassium hydroxide, KOH(aq), with 0.100 mol/L nitric acid, HNO_3(aq). The student used a pH meter to measure the changing pH of the reaction mixture. The data are in the table below.

Titration pH Data

Volume of 0.100 mol/L HNO_3(aq) added (mL)	Reaction mixture pH
0.00	13.00
10.00	12.82
20.00	12.63
30.00	12.40
40.00	12.05
45.00	11.72
49.00	10.00
50.00	7.00
51.00	4.00
55.00	2.32
60.00	2.04
70.00	1.78
80.00	1.64
90.00	1.54
100.00	1.48

Procedure

1. Use a spreadsheet program to plot these data as an *xy* scatter graph. Include all appropriate labels on the axes and a title for the graph. Select the graph display mode that does not include a line through the data points. (Alternatively, create your graph on graph paper.) **ICT**

Analysis

1. Print your graph and draw a smooth line of best fit through the data points.

2. Locate and then label the equivalence point pH on the graph.

3. Suggest three suitable indicators for this titration and list the colour change you are likely to see for each. Explain why the indicators you selected are appropriate.

4. How does the shape of this pH titration curve compare with the shape of the curve in Figure 8.8? How does it compare with the shape of the curve in Figure 8.9?

5. Use your graph to determine the concentration of the KOH(aq) sample.

Extension

6. The indicator methyl violet changes colour from yellow to blue over a pH range of 0.0 to 1.6. Would methyl violet be a suitable indicator to use for this titration? Explain.