Lesson 3b – dilution before titration and indicators.

A monoprotic acid solution, whose concentration is unknown, is titrated with a 0.100 M NaOH solution. The Ph curve for this titration is shown on the right.
A 20.00 mL aliquot is taken from the original bottle of this monoprotic acid and placed in a 200 mL volumetric flask and made to the mark using distilled water.
A 25.00 mL aliquot was transferred from the volumetric flask to a 100mL conical flask and titrated to the end point. This was repeated two more times and an average titre of 40.00 mL was obtained

mL 0.1M NaOH titrant
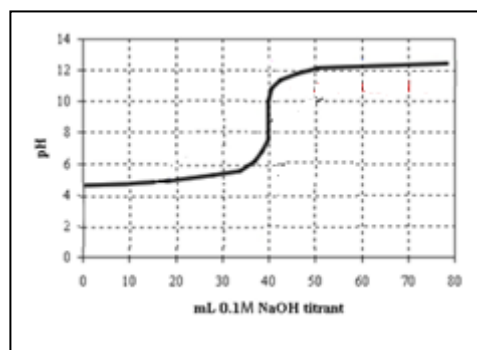
a) Write the balanced overall equation for the reaction taking place in the conical flask between the weak monoprotic(HA) acid and the NaOH.

b) Find the mol of the NaOH in the average titre

c) Find the mol of the monoprotic acid in the conical flask.

d) Find the mol of the monoprotic acid in the volumetric flask.

e) Find the concentration in mol/L in the original undiluted sample of the monoprotic acid

f) Is the monportic acid a weak or strong acid? Explain.

g) What is an ideal indicator to use in this titration? Justify your reasoning.

h) The chemist decided to use methyl red as the indicator. How does this choice of indicator impact the average titre?

Name of indicator	pH range
methyl orange	3.1-4.4
methyl red	4.4-6.2
bromothymol blue	6.0-7.6
phenolphthalein	8.3-10.0

Unpack the information by drawing a flow diagram like the one below.

20.00mL original sample

200mL volumetric flask

25.00mL aliquot is taken

An average titre of 40.00 mL of a 0.100 M NaOH.