

TITRATION VALIDATION TEST

NAME: _____

25 Marks + 5 for accuracy = 30 marks

Mark = _____/30

AIM

To determine the percentage by mass of ammonia in household ammonia.

METHOD

1. Rinse the equipment with the appropriate solution or distilled water, if necessary.
2. Pipette 20 mL of household ammonia into a 250 mL volumetric flask. Determine the exact mass of the household ammonia solution. Do not pipette the ammonia solution into the volumetric flask while it is on the balance.
3. Make the volume up to 250 mL with distilled water and mix well. (Use the appropriate technique for doing this).
4. Titrate the standard HCl solution from a burette against 20mL aliquots of diluted household ammonia solution, each with 3-5 drops of methyl orange indicator added.
5. Record your results below.
6. Repeat steps 3 and 4 until you obtain 3 concordant results.

RESULTS

Concentration of the standard HCl solution =

Mass of the 250 mL volumetric flask =

Mass of the 250 mL volumetric flask + 20mL of household ammonia =

Mass of 20 mL of household ammonia =

	Rough estimate	Titration 1	Titration 2	Titration 3	Average Titration volume (mL)
Initial reading (mL)					
Final reading (mL)					
Titration volume (mL)					

(1 mark)

(7 marks)

Accuracy : Mark =/5

QUESTIONS

1.(a) Complete the following table by circling the correct alternative in the right hand column

Equipment	Rinsed with	
Volumetric flask	Water	Ammonia solution
Burette	Water	Hydrochloric acid
Conical flask	Water	Ammonia solution

(3 marks)

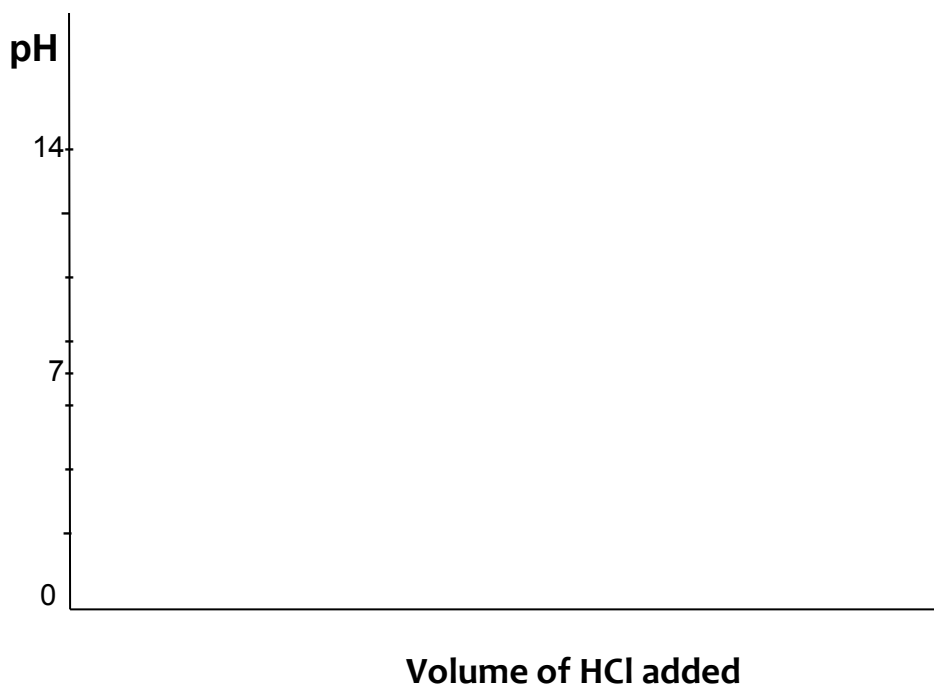
(b) How would the titration volume be affected if the burette was rinsed with the **incorrect** solution in part (a)? Justify your answer.

(2 marks)

2. During the titration one group of students washed their pipette with water but neglected to rinse it with ammonia solution before titrating. Assuming they do only one titration, what effect would this have on the calculated percentage of ammonia in their household ammonia. Explain your answer.

(4 marks)

3.(a) Sketch a titration curve on the axes below for the HCl/NH₃ titration you performed in the laboratory. Indicate the volume of HCl added at the end point. Label this point **A**.



(4 marks)

(b) Use your graph to explain why methyl orange (pH range 3.2 – 4.4) was chosen as the indicator in preference to phenolphthalein (pH range 8.2 – 10) for this titration. Use equations to support your answer.

(4 marks)

END OF TEST