

AGA KHAN UNIVERSITY EXAMINATION BOARD

HIGHER SECONDARY SCHOOL CERTIFICATE

CLASS XI




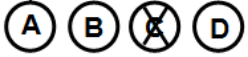

ALTERNATE TO PRACTICAL (ATP)

Chemistry Paper III

Time: 25 minutes Marks: 15

INSTRUCTIONS

1. Read each question carefully.
2. Answer the questions on the separate answer sheet provided. DO NOT write your answers on the question paper.
3. There are 100 answer numbers on the answer sheet. Use answer numbers 1 to 15 only.
4. In each question, there are four choices A, B, C, D. Choose ONE. On the answer grid, black out the circle for your choice with a pencil as shown below.

Correct Way		Incorrect Ways	
1		1	
		2	
		3	
		4	

Candidate's Signature

5. If you want to change your answer, ERASE the first answer completely with a rubber, before blacking out a new circle.
6. DO NOT write anything in the answer grid. The computer only records what is in the circles.
7. You may use a scientific calculator if you wish.

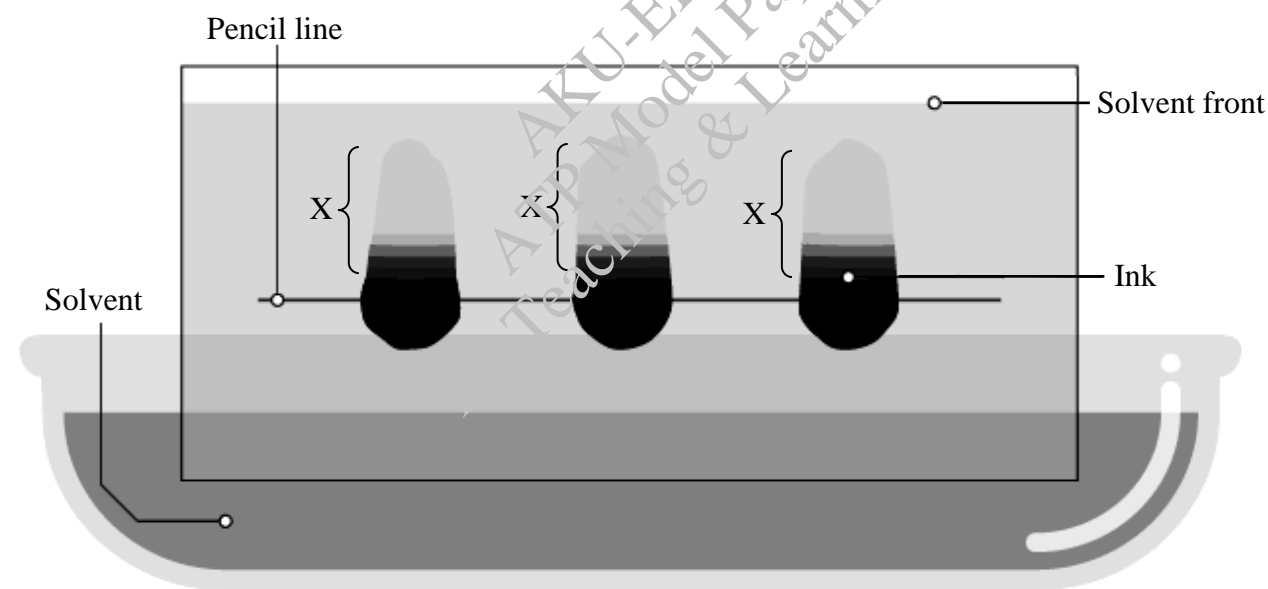
1. A student carries out a gravimetric analysis of 25 mL solution of BaCl_2 to estimate the amount of Ba^{2+} ions present in a solution. Assume the molecular weight of Ba^{2+} salt formed and weight of Ba^{2+} ion is 253.4 g and 137.4 g, respectively.

With the observation during the experiment, he concluded the following.

Weight of Filter Paper	Weight of Filter Paper + Precipitates of Ba^{2+} Salt Formed
1.0 g	1.6 g

With reference to the given observation, the amount of Ba^{2+} ions obtained in 25 mL of the solution will be

- A. 0.60 g
 B. 0.33 g
 C. 1.11 g
 D. 0.54 g
2. The given diagram shows the separation of different colours present in an ink by using paper chromatography.

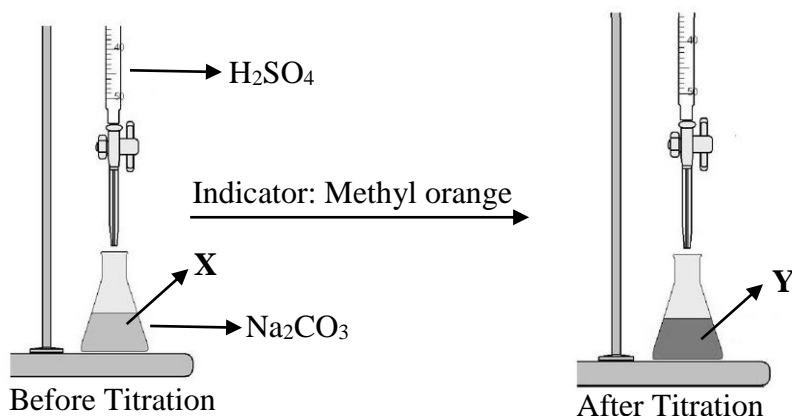


The component X that goes farther away from the pencil line is

- A. highly soluble in solvent.
 B. the main component of ink.
 C. present in greater concentration.
 D. strongly attached with filter paper.

3. In a solution of copper(II) ions, dilute HCl is added and then H_2S gas is passed through it. The copper(II) will be precipitate out in the form of
- A. cuprous ion.
 - B. hydride ions.
 - C. chloride ions.
 - D. sulphide ions.
4. Addition of HCl gas to the aqueous solution of NaCl will suppress the dissociation of
- A. sodium ions.
 - B. chloride ions.
 - C. hydroxide ions.
 - D. hydronium ions.
5. The concentration of commercial grade sulphuric acid is 18.4 M.
- To prepare 250 cm^3 of 0.2 M sulphuric acid solution from the given solution, the volume of sulphuric acid required will be
- A. 0.002 cm^3
 - B. 0.014 cm^3
 - C. 2.717 cm^3
 - D. 14.72 cm^3
6. A student had to estimate the amount of NaOH present in a laundry soap. For this purpose, he prepared 250 cm^3 of a soap solution from the entire sample. He used 10 cm^3 of this solution and titrated it against 0.5 M H_2SO_4 by using phenolphthalein. The end point was obtained at 1.4 cm^3 .
- The amount of NaOH present in the given sample would be
- A. 0.07 g
 - B. 1.4 g
 - C. 2.8 g
 - D. 5.6 g

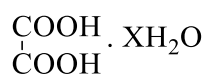
7. Consider the given set-up for the titration of sodium carbonate with sulphuric acid. **X** and **Y** represents the colour of an indicator.



The option that CORRECTLY indicates **X** and **Y** is

	X	Y
A	yellow	red
B	red	orange
C	pink	colourless
D	orange	yellow

8. Consider the given structure of hydrated oxalic acid.



If 500 cm³ of 0.05 M solution contains 3.15 g of oxalic acid, then the water of crystallisation present in the structure of oxalic acid will be

(Note: ^1_1H , $^{12}_6\text{C}$ and $^{16}_8\text{O}$)

- A. 0
 B. 1
 C. 2
 D. 3
9. Na_2CO_3 can be considered as all of the following EXCEPT that it is a
- A. weak base.
 B. hygroscopic.
 C. primary standard.
 D. strong electrolyte.

10. Nabeel has titrated a solution of $\text{C}_2\text{O}_4\text{H}_2 \cdot 2\text{H}_2\text{O}$ of unknown concentration against 10 mL of 0.1 M NaOH solution. He calculated that the concentration of $\text{C}_2\text{O}_4\text{H}_2 \cdot 2\text{H}_2\text{O}$ is 0.05 M.

He performed the same experiment after two days using same solutions but he obtained a different result. After that, he standardised the same solution of NaOH against 0.1 M of HCl and the calculated concentration of NaOH was 0.8 M.

(**Note:** The entire analysis was carried out at room temperature and the indicator used was phenolphthalein.)

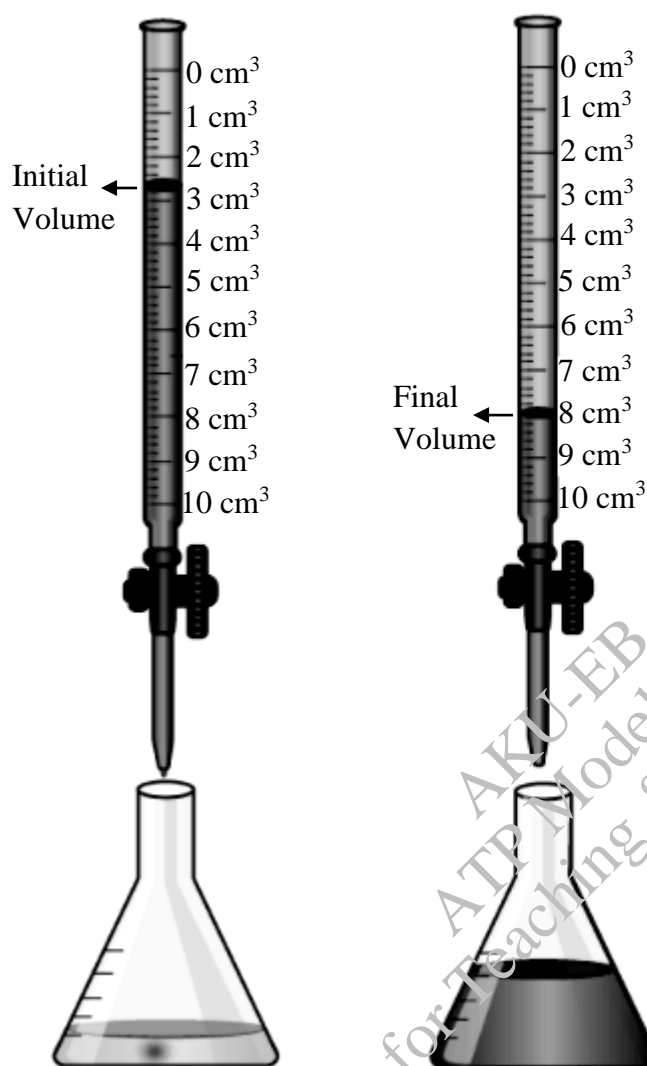
After analysing the given situation, it can be concluded that the secondary standard solution was

- A. HCl
 - B. NaOH
 - C. $\text{C}_2\text{O}_4\text{H}_2 \cdot 2\text{H}_2\text{O}$ of 0.05 M concentration.
 - D. $\text{C}_2\text{O}_4\text{H}_2 \cdot 2\text{H}_2\text{O}$ of unknown concentration.
11. 13.7 kcal is the heat of neutralisation that remains constant when a strong acid reacts with a strong base because
- A. water absorbs extra heat evolved.
 - B. strong acids and bases ionise completely.
 - C. a soluble salt is formed as the end product.
 - D. 1-gram equivalent of acid and bases are always used.
12. A small volume of H_2SO_4 is used in the standardisation of KMnO_4 along with the standard solution of oxalic acid.

The presence of H_2SO_4 ensures that it

- A. is used as an oxidising agent.
- B. acts as a dehydrating agent.
- C. works as an indicator.
- D. produces a catalyst.

13. The given set up shows the initial and final burette readings, in which FeSO_4 solution of an unknown concentration is titrated against the standard KMnO_4 solution.



The volume of KMnO_4 that will be used to estimate the amount of iron present in the given sample is

- A. 5.4 cm³
- B. 5.2 cm³
- C. 7.8 cm³
- D. 8.0 cm³

14. If a solution mixture of $\text{K}_2\text{C}_2\text{O}_4$ and K_2SO_4 is titrated against a standard solution of KMnO_4 , then which of the following reactions will take place?
- A. SO_4^{-2} will reduce to SO_2
 - B. SO_4^{-2} will reduce to SO_3
 - C. $\text{C}_2\text{O}_4^{-2}$ will reduce to CO_2
 - D. MnO_4^{-1} will reduce to MnO_2
15. $\text{FeSO}_4 \cdot (\text{NH}_4)_2\text{SO}_4 \cdot 6\text{H}_2\text{O}$ is classified as a
- A. double salt.
 - B. neutral salt.
 - C. complex salt.
 - D. hygroscopic salt.

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END OF PAPER

Please use this page for rough work

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