



**FEDERAL BOARD OF INTERMEDIATE
AND SECONDARY EDUCATION
H-8/4, ISLAMABAD**



No.1-10/FBISE/RES/320

06 October, 2026

NOTIFICATION

The Assessment Frameworks for Composite Practical-Based Assessment (PBA), in accordance with the Inclusive Scheme of Studies 2024 (Revised Version-I), comprising lists of experiments/practicals, relevant instructions, and Model Question Papers (Composite) for the subjects of Physics, Chemistry, Biology, and Computer Science at SSC and HSSC levels, based on the National Curriculum of Pakistan 2022–23, along with the E-Sheets for the said subjects, are hereby notified for implementation with effect from the First Annual Examination 2027 and onwards.

2. The Assessment Frameworks for Composite PBA and E-Sheets are available at FBISE website. The weblink is https://www.fbise.edu.pk/curriculum_model_paper.php

(SYED ZULFIQAR SHAH)

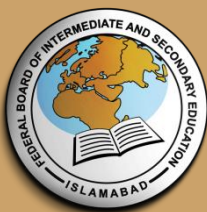
Deputy Secretary
Research and Academics
051-9269539

Heads of all Institutions affiliated with FBISE
at SSC & HSSC levels

Distribution:

1. Director General, Federal Directorate of Education, G-9/4, Islamabad
2. Director General, FGEI, Directorate (Cantonments/ Garrisons), Sir Syed Road, Rawalpindi
3. Assistant Chief of the Air Staff (Education), PAF Air Headquarters, Peshawar
4. Director General (Schools), Directorate of Education Gilgit-Baltistan
5. Director Education, Directorate of Naval Educational Services, Naval HQ, Islamabad
6. Deputy Director General (DDG), Army Public Schools and Colleges System Secretariat, GHQ, Rwp
7. Director, CB Education Directorate, C/o Chaklala Cantonment Board, Rawalpindi
8. Director (Education), Fauji Foundation Head Office, Welfare Division, Chaklala, Rawalpindi
9. Director General, OPF Head Office, G-5, Islamabad
10. Director Education, Kahuta Research Laboratory (KRL), Kahuta, District Rawalpindi
11. Prof. Mehr Khan Mughal, Principal, Khurshid International High School & College for Girls, Bhoun Road, Chalk
12. Mr. Muhammad Basharat, Principal, Allied School, Al-Qaim Palaza, Jhangi Syedan, IBD
13. Mrs. Rukhsana Khan, Principal, Bright Beginnings School & College, House # 73, St # 2, G-15/2, JKCHS, Islamabad
14. The Director, Punjab Group of Colleges, 6th Road, Rawalpindi
15. The Director Regional Office (North), Beaconhouse Regional Office (North), Capital View Road, Mohra Nur, Banigala Islamabad
16. The Director Regional Office (North), The City School, Street 7, NPF, Sector E-11/4, Islamabad
17. Roots International Schools and Colleges, Head Office, Main Service Road West, Opp. G-13/4, IBD
18. Brig Dr. Muhammad Hanif (R), SI(M), Principal, Dr. A Q Khan School & College, Bahria Town, Phase 8, Islamabad

19. The Citizen Foundation, Plot No. 20, Sector # 14, Near Brookes Chowrangi, Korangi Industrial Area, Karachi
20. Director, Maarif Pak Turk School & College, Head office, H-8/1 Islamabad
21. Director Education, PAEC Headquarter, K-Block Islamabad
22. All HODs, FBISE, Islamabad
23. Director IT (with the request to upload the same on FBISE website and social media)
24. Deputy Controller of Examination (Strong Room), FBISE Islamabad
25. Deputy Director (Colleges), Directorate of Education Gilgit-Baltistan
26. Incharge, FBISE, Sub-Office, Gilgit
27. Incharge, FBISE, Sub-Office, Skardu
28. PA to Chairman, FBISE, Islamabad
29. APS to Secretary, FBISE, Islamabad
30. APS to Director (R&A), FBISE, Islamabad
31. Chat Room. FBISE, Islamabad



ASSESSMENT FRAMEWORK

FOR PRACTICAL BASED ASSESSMENT (PBA) - COMPOSITE

CHEMISTRY

SSC LEVEL



NATIONAL CURRICULUM OF PAKISTAN (2022-23)

SCHEME OF STUDIES 2024

WE WORK FOR EXCELLENCE

**FEDERAL BOARD OF INTERMEDIATE AND SECONDARY
EDUCATION (FBISE), ISLAMABAD**



Table of Contents

<u>S. No</u>	<u>Contents</u>	<u>Page No.</u>
1.	Acknowledgement	1
2.	About the PBA Assessment Framework	2
3.	Guidelines/instructions for teachers/paper setters	3
4.	List of Experiments aligned with SLOs (Composite PBA)	4
5.	Model Question Paper Chemistry SSC (COMPOSITE)	7

ACKNOWLEDGEMENT

ACKNOWLEDGEMENT

It is a great honour that we at the Federal Board of Intermediate and Secondary Education (FBISE) has developed the Assessment Framework (AF) for the Practical Based Assessment (PBA) of Chemistry at the Secondary School Certificate (SSC) level. The primary objective of the Assessment Framework is to optimize the Student Learning Outcomes (SLOs) of curriculum 2022-23 that are associated with practical concepts and laboratory work. This comprehensive framework has been crafted meticulously by subject matter and assessment experts who conducted an in-depth review of all learning outcomes of SSC level Chemistry curriculum.

This significant undertaking was the result of a series of extensive meetings and collaborative efforts of the subject and assessment experts. Their dedication and expertise have been instrumental in bringing this framework to fruition.

The Assessment Framework for Practical Based Assessment (PBA) will serve as a guiding document for students, teachers, and paper setters. Students will receive clear directions for preparing themselves for the PBA examinations. Similarly, teachers will use it as a guide to perform laboratory work and to prepare students for the final PBA examinations. Paper setters of PBA will also seek guidance from this document and prepare PBA paper accordingly for annual examinations. It may be noted that only those students will be able to attempt the PBA paper who have performed all the practicals in laboratory.

Following subject as well as assessment experts remained constantly engaged in the development of the Assessment Framework for PBA:

1. Dr. Shaista Sabir, Associate Professor, PAEC Model College for Girls, Nilore, Islamabad
2. Mr. Naeem Mushtaq, Associate Professor, Islamabad Model College for Boys, G-10/4, Islamabad
3. Ms. Javeria Gul, HOD Chemistry, Pak Turk Maaarif International School, Islamabad

The whole work was successfully accomplished under the able supervision and guidance of Dr. Ikram Ali Malik, Chairman, FBISE and due to the hard work and dedication of the staff of Research Section of FBISE, in particular, Syed Zulfiqar Shah, Deputy Secretary, Research and Academics who played pivotal role in finalizing the Assessment Framework for PBA.

MIRZA ALI
Director (Test Development)
FBISE, Islamabad

ABOUT THE PBA ASSESSMENT FRAMEWORK

To ensure clarity and precision in the understanding of Practical Based Assessment (PBA) Question Paper, the Student Learning Outcomes (SLOs) have been categorized into two distinct groups: formative for PBA and summative for PBA in the composite Assessment Frameworks for SSC Classes based on the Revised Version-I of Inclusive Scheme of Studies 2024. Subsequently, all the SLOs of SSC-I and SSC-II meant for summative PBA have been translated into workable and functional composite lists of practicals which are part of this booklet. This extraction of lists of practicals helps in effectively measuring student progress and understanding of the scientific concepts linked with laboratory work. These practicals must be performed by the students under the supervision of their teachers in the laboratories in order to prepare themselves for the PBA Examinations.

The Assessment Framework for Practical Based Assessment (PBA) will act as a comprehensive guide for students, teachers, and paper setters. Students will receive clear instructions in order to perform experiments in the laboratory and prepare themselves for the PBA examination. Teachers will use the same to strategize the optimal use of the laboratory for performing experiments (major and minor).

The Model Question Paper for Practical Based Assessment (PBA), along with clear instructions, has also been developed and made part of this booklet to provide a structured format for upcoming examinations. The model question paper ensures consistency and fairness, offering students a comprehensive understanding of PBA examination.

All the experiments have been aligned with their corresponding SLOs marked summative for PBA. The purpose of this alignment is to explain how the experiments relate with their corresponding summative SLOs for PBA.

Instructions for paper setters have also been included before the PBA model question paper, providing self-explanatory guidance on the selection and nature of each question which is part of the model paper.



PRACTICAL BASED ASSESSMENT (PBA)
COMPOSITE

Chemistry SSC Level for Annual Examination 2027 & onwards
Chemistry Curriculum (2022-23)-Scheme of Studies 2024



Guidelines/instructions for teachers/paper setters:

- i. The paper will consist of two sections i.e section A and B.
- ii. Section A will include Major Practicals. This section will have three questions, each question carrying 6 marks having parts in it, and each question will be performance / calculation/procedures/observations based encompassing a single practical.
- iii. Section B will include Minor Practicals. This section will also have three questions, each carrying 4 marks having parts in it. Each question may be based on single or multiple practicals.
- iv. The weightage of section A will be 60% i.e 18 marks, while that of section B will be 40 % i.e 12 marks.
- v. In Practical Based Assessment (PBA), there will be no marks for practical notebooks and viva voce. However, students may record procedures, observations, apparatus and calculation etc on any type of plain papers/work sheets / practical folders for their future memory of all aspects of practical performance in order to attempt the PBA Examination amicably.
- vi. It may be noted that performance of all the prescribed practicals is mandatory in the laboratory during the whole academic session because only those students will be able to attempt the PBA who have performed the practicals in the laboratory as per requirement of each practical.
- vii. MCQs will not be included/assessed in the Practical Based Assessment paper.
- viii. Questions carrying 0.5 marks will not be included/assessed as single part in any section of the PBA paper.



**List of Experiments aligned with SLOs (Composite PBA)
For SSC Annual Examination 2027 & onwards
Chemistry Curriculum (2022-23)-Scheme of Studies 2024**



Note: In the Practical-Based Assessment (PBA), questions will be taken/developed from the list of experiments provided below, aligned with the summative SLOs listed in the corresponding column.

Section A (60% of practical marks — 18 Marks)

Major experiments	No.	List of Experiments	Aligned SLOs
	1.	Separation of mixture of water and alcohols by fractional distillation	SLO:C-09-F-12 Explain methods of separation and purification (some example include: a) using a suitable solvent b) filtration c) crystallization d) simple distillation e) fractional distillation)
			SLO:C-09-F-13 Suggest suitable separation and purification techniques, given information about the substances involved, and their usage in daily life
	2.	Separate given mixture of inks by paper chromatography	SLO:C-09-F-17 Describe how paper chromatography is used to separate mixtures of soluble substances, using a suitable solvent.
	3.	Separate the Pb^{2+} and Cd^{2+} ions by paper chromatography	SLO:C-09-F-18 Describe the use of locating agents when separating chromatography in mixtures containing colorless substances. SLO:C-09-F-19 Interpret simple chromatograms (For context, students should identify: a) unknown substances by comparison with known substances b) pure and impure substances) SLO:C-09-F-20 State and use the equation for R_f
	4.	Determine the exact molarity of the NaOH solution Volumetrically	SLO: C-10-B-13 Calculate concentration of a solution in a titration using empirical data SLO: C-09-F-04 Justify why chemists use cm^3 , g and s as more practical units when working with small amounts in lab. SLO: C-09-F-09 Identify appropriate apparatus for the measurement of time, temperature, mass and volume, including: a. stop watches. b. thermometers. c. balances, d. burettes, e. volumetric pipettes, f. measuring cylinders. g. gas syringes

	5.	Detection and confirmation of gases. a. Ammonia, NH ₃ , using damp red litmus paper. b. Carbon dioxide, CO ₂ , using limewater. c. Chlorine, Cl ₂ , using damp litmus paper.	SLO:C-09-F-15 Describe tests to identify important gasses (Some examples include: a. ammonia, NH ₃ , using damp red litmus paper b. carbon dioxide, CO ₂ , using limewater c. chlorine, Cl ₂ , using damp litmus paper d. hydrogen, H ₂ , using a lighted splint e. oxygen, O ₂ , using a glowing splint f. sulfur dioxide, SO ₂ , using acidified aqueous potassium manganate(VII)) SLO: C-09-10-G-10 Describe tests (qualitative, gas tests, other tests)
Section B (40% of Practical Marks — 12 Marks)			
Minor Practicals	Sr. No.	Minor Experiments (Part – II)	SLO Description
	1.	Separate naphthalene from the given mixture of sand and salt by sublimation	SLO: C-10-B-08 Discuss applications of sublimation around us. SLO: C-09-10-G-13 Carry out separation and purification techniques
	2.	Identify following metal ions by flame test. (Na⁺ K⁺, Ca²⁺, Cu²⁺ and Ba²⁺)	SLO:C-09-F-16 Explain the use of a flame test to identify important cations: (Some examples include: a) lithium, Li ⁺ b) sodium, Na ⁺ c) potassium, K ⁺ d) calcium, Ca ²⁺ e) copper(II), Cu ²⁺ f) barium, Ba ²⁺
	3.	Prepare pure crystals of CuSO ₄ .5H ₂ O	SLO:C-09-F-12 Explain methods of separation and purification (some example include: a) using a suitable solvent b) filtration c) crystallization d) simple distillation e) fractional distillation) SLO: C-09-F-11 Define important terms associated with creating chemical solutions.(Some examples include: a. Solvent as a substance that dissolves a solute. b. Solute as a substance that is dissolved in a solvent. c. Solution as a mixture of one or more solutes dissolved in a solvent. d. Saturated solution as a solution containing the maximum concentration of a solute dissolved in the solvent at a specified temperature. e. Residue as a substance that remains after evaporation, distillation, filtration or any similar process. f. Filtrate as a liquid or solution that has passed through a filter).
	4.	Determine the melting point of Naphthalene	SLO:C-09-F-14 Identify substances and assess their purity using melting point and boiling point information
	5.	Determine the boiling point of Ethyl Alcohol	SL:C-09-F-14 Identify substances and assess their purity using melting point and boiling point information

6.	Demonstrate a metal displacement reaction in aqueous medium.	SLO:C-09-G-12 Carry out the following tests under supervision: - identification of metal ions, non-metal ions and gases - chemical test for water - test-tube reactions of dilute acids, including ethanoic acid - tests for oxidising and reducing agents - melting points and boiling points - displacement reactions of metals and halogens - temperature changes during reactions
7.	Investigate chemical tests for the presence of water using anhydrous copper(II) sulfate	SLO: C-09-10-G-12 Carry out the following tests under supervision: - identification of metal ions, non-metal ions and gases - chemical test for water - test-tube reactions of dilute acids, including ethanoic acid - tests for oxidising and reducing agents - melting points and boiling points - displacement reactions of metals and halogens - temperature changes during reactions
		SLO: C-09-D-12 Investigate chemical tests for the presence of water using anhydrous copper(II) sulfate
8.	Test the purity of water using melting point and boiling point	SLO: C-09-D-13 Explain how to test the purity of water using melting point and boiling point
		SLO: C-09-D-14 Distinguish between Distilled water and tap water with their applications in practical chemistry
		SLO:C-09-F-14 Identify substances and assess their purity using melting point and boiling point information

NOTE: The SLO: C-09-10-G-06 to SLO:C-09-10-G-09 are valid for all experiments.

The SLO: C-09-10-G-10, C-09-10-G-14 to SLO:C-09-10-G-20 will be the part of experiments where applicable.



**Model Questions Paper Chemistry SSC (COMPOSITE)
FOR ANNUAL EXAMINATION 2027 & ONWARDS
Practical Based Assessment (PBA)
Chemistry Curriculum 2022-23 and Scheme of Studies 2024**



Total Marks: 30

Time: 2 hours

Note: Attempt all questions and write answers within provided spaces on E-Sheet.

SECTION A (6 x 3 = 18)

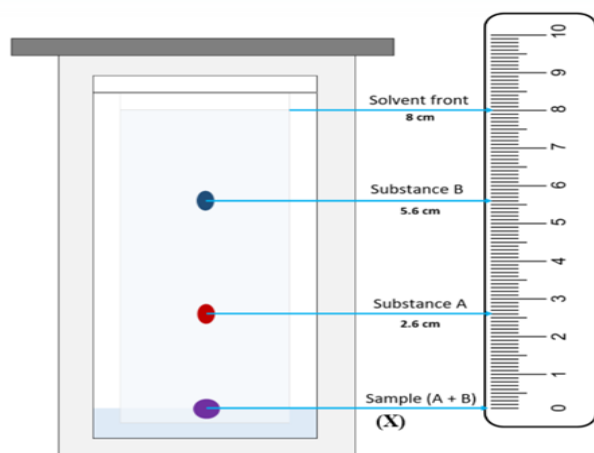
Q No.1 Ali, a Grade 10 student, is tasked with separating the components of a mixture of inks using paper chromatography in the school laboratory. He has been provided with the following materials:

- Chromatography paper
- A pencil
- A capillary tube
- Beakers
- A solvent (water/alcohol mixture)
- Ink samples (Mixture X)

Ali is instructed to follow the standard procedure for paper chromatography and analyze his results to identify the composition of mixture X.

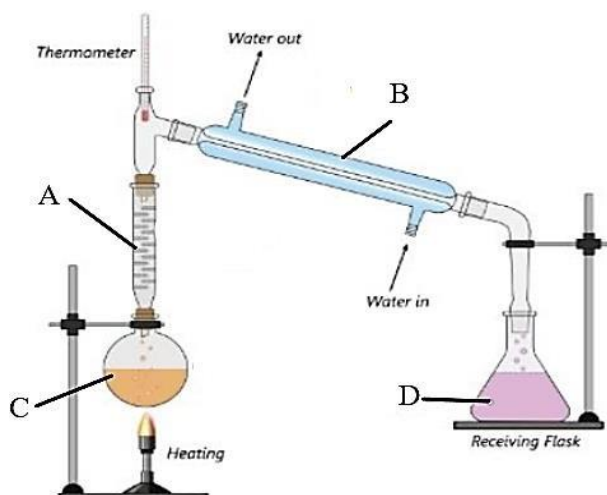


- a. Ali begins by drawing a baseline on the chromatography paper. Where should Ali draw the line, and why should he use a pencil instead of a pen? [1]
- b. Ali used a capillary tube to apply small spots of X (mixture of inks). How can he ensure that the spots are properly placed for effective separation? [1]
- c. After applying the ink spots, Ali placed the chromatography paper into a beaker with the solvent. What must Ali check to ensure the setup is correct before starting the experiment? [1]
- d. How can Ali determine when the experiment is complete, and what should he do immediately after removing the paper from the beaker? [1]
- e. Ali observed that X separates into two distinct spots. What conclusion can Ali draw about the composition of X? [1]



- f. Perform the necessary calculations to Calculate the R_f values for substance A and B. [1]

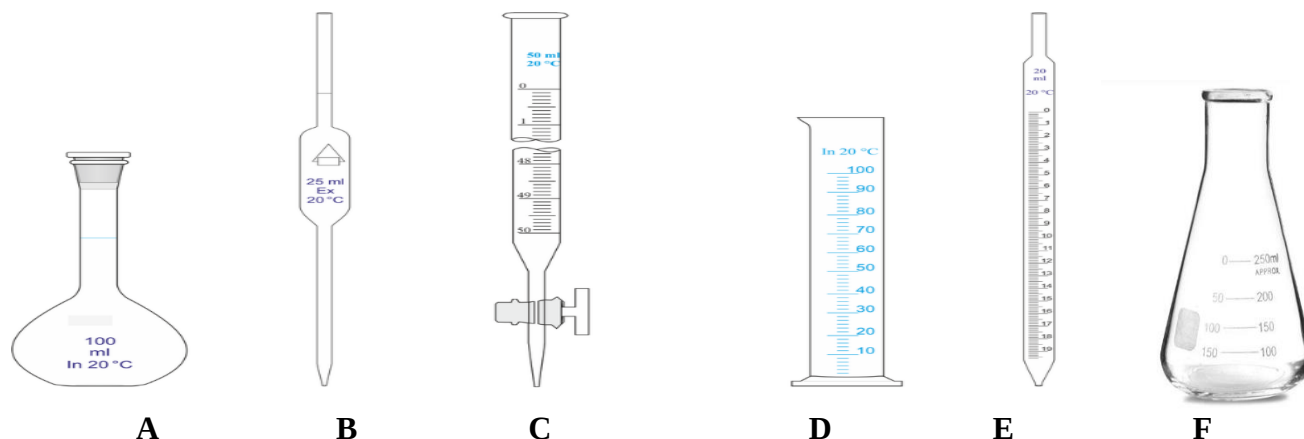
Q No.2 In the school laboratory, students are tasked with separating a mixture of water and alcohol using fractional distillation. The arrangement of the apparatus is shown in the figure below.



- Label the components A, B, C and D. [1]
- What is the purpose of the component labelled as 'A' in this setup, and how does it improve the separation process? [1]
- As you begin heating the mixture, which component (water or alcohol) will vaporize first, and why? [1]
- During the experiment, the thermometer stabilizes at around 78°C . What does this indicate, and which liquid is being collected at this temperature? [1]
- How can you confirm that the distillate collected at 78°C is alcohol and not water? [1]
- How would you adjust the heat source to ensure a steady and controlled distillation process? [1]

Q No.3 Purpose of this experiment is to determine the exact molarity of NaOH volumetrically. 0.1 M HCl is given.
In this experiment NaOH is taken in the conical flask and HCl in the burette.

- a. Which of the following apparatus is used to transfer 10cm^3 of NaOH into the conical flask? [1]



Chemicals used:

Phenolphthalein

Distilled water

0.1M HCl

- b. See the figure given below and record the observations in table. [2]

Titration 1		Titration 2		Titration 3	
Initial Reading	Final Reading	Initial Reading	Final Reading	Initial Reading	Final Reading

Observation Table:

Sr. No	Initial Reading	Final Reading	Volume of HCl used
1	3.2cm^3		
2			
3			

Mean volume of HCl used= cm^3

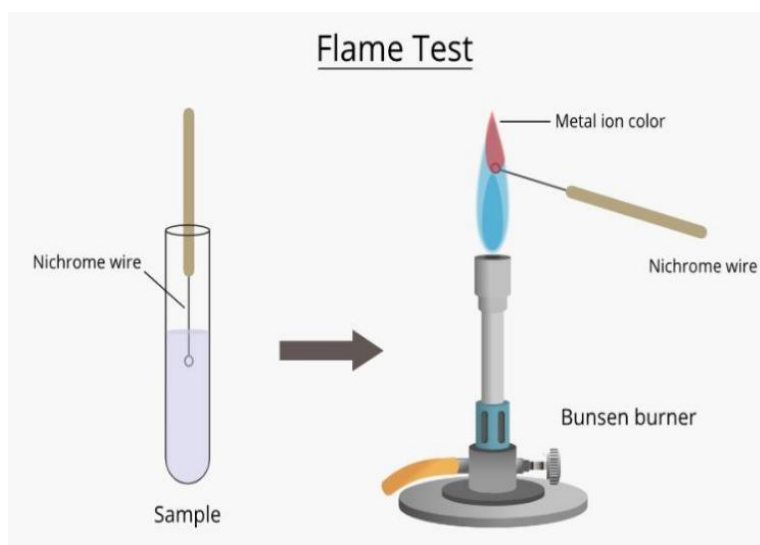
- c. By using the data given in the part “b” and volume of NaOH used. Calculate the molarity of NaOH. [1]
d. Why is it important to perform multiple titrations and take an average of the results? [1]
e. If a student accidentally adds too much indicator to the solution, how might this affect the titration results? [1]

SECTION B (4x3 = 12)

Q No.4 A student **Y** is working in the school laboratory to identify metal ions using the flame test. He is provided with:

- Solid samples of salts containing Na^+ , K^+ , Ca^{2+} , Cu^{2+} , and Ba^{2+} ions.
- A clean platinum/nichrome wire.
- Concentrated hydrochloric acid (for cleaning the wire).
- A Bunsen burner.
- Safety equipment (goggles, gloves).

Y must perform the flame test for each sample and record the flame color to identify the metal ion.



- a. What is the purpose of cleaning the nichrome/platinum wire before testing a new sample. Why is this step important. [1]
- b. Describe how **Y** should hold the wire in the Bunsen burner flame to observe the colour effectively. If **Y** observes a yellow flame while testing, which metal ion is likely present in the sample? [1]

During an experiment to determine the boiling point of ethanol, a student recorded the following temperatures while heating ethanol. Analyze the data and answer the questions:

Time (min)	Temperature ($^{\circ}\text{C}$)
1	60
2	70
3	75
4	78
5	78
6	78

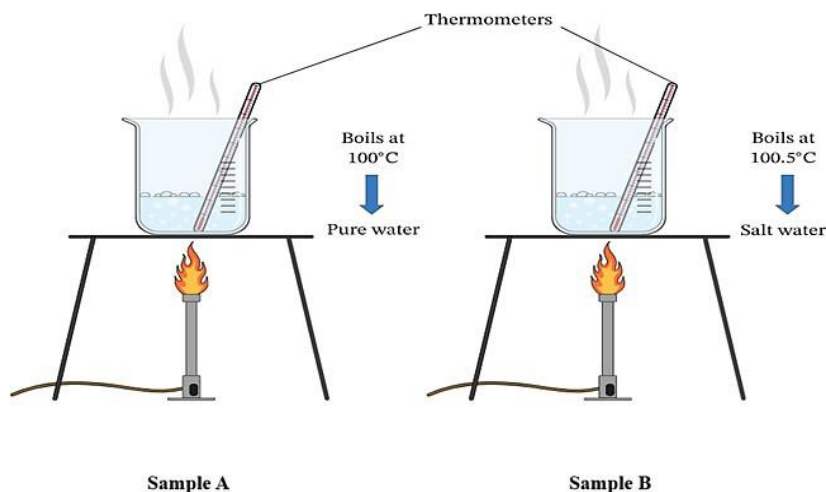
- c. At what temperature did ethanol start boiling? Why does the temperature stop increasing after this point? [1]
- d. What physical change occurs when ethanol reaches its boiling point? [1]

Q No.5

- a. A group of students is conducting an experiment to test the purity of water by determining its melting and boiling points. They have two samples: **Sample A**, which they suspect is pure water, and **Sample B**, which they suspect contains impurities.

The students use a thermometer to measure the temperature at which both samples melt and boil. They perform the following steps

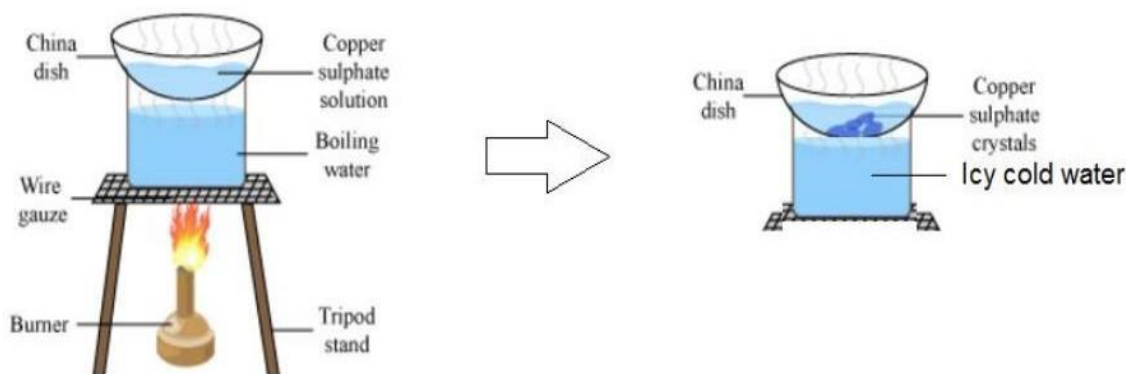
They boil both samples separately in an open container on a Bunsen burner and record the temperature at which the samples start to boil.



Here are the results:

Sample A melts at 0°C and boils at 100°C. Sample B melts at -2°C and boils at 102°C.

- Explain the significance of the results if pure water has a melting point of 0°C and a boiling point of 100°C at standard atmospheric pressure. [1]
 - How can the experiment help determine whether a water sample is contaminated with substances like salt or other solutes? [1]
- b. The metal displacement reactions involve the displacement of one metal ion from a solution by another metal. Students were provided with the zinc and copper solution to perform the experiment. What is the expected outcome of adding zinc metal to copper (II) sulphate solution? [1]
- c. The image below shows crystals of Copper Sulphate forming during the cooling of the solution. Explain how the rate of cooling affects the size of the crystals. [1]



Q No.6 A student prepares pure crystals from an impure sample of copper(II) sulfate by making a hot saturated solution.

- a. How can the student confirm that the solution made at high temperature is saturated before cooling it? [1]
- b. What would happen to the crystal size if the hot filtrate is cooled rapidly in an ice bath compared to cooling slowly at room temperature? [1]
- c. Explain why soluble impurities present in the original sample do not crystallize out with the copper(II) sulfate. [1]
- d. Describe how the crystals are washed and dried after the final filtration to avoid losing yield. [1]



111 032 473

For more information, please visit
www.fbise.edu.pk



/ Federal.BISE.Official



/ FBISEOfficial



/ fbise.official