NCERT Solutions for Class 9 Science Chapter 5 Exploring Mixtures and Their Separation PDF Download (2026) + Important Questions

Chemistry ka naam sunkar darr lagta hai? Fikar mat karo! Jab hum apne aas-paas dekhte hain, toh mostly cheezein pure nahi hoti—woh mixtures hoti hain. Chahe wo subah ki chai ho, hawa ho, ya phir soil, sab kuch ek mixture hai. This is exactly what **CBSE Class 9 Science Chapter 5: Exploring Mixtures and Their Separation** is all about!

Yeh chapter sirf aapke Class 9 school exams ke liye hi important nahi hai. Agar aap aage chalkar Science lete hain ya CUET target karte hain, toh separation techniques (jaise distillation aur chromatography) aapka ultimate foundation banengi.

In this ExamSpark special guide, we have provided the complete **NCERT Solutions for Class 9 Science Chapter 5**, handpicked **Board Exam Questions 2026**, and a free **NCERT PDF Download** link. Bina time waste kiye, chalo shuru karte hain!

CHAPTER OVERVIEW

Here is a quick snapshot of what you are going to study in this chapter:

Feature	Details
Chapter Name	Exploring Mixtures and Their Separation
Subject	Science (Chemistry)
Class	Class 9
Board	CBSE / NCERT (2026-27)

Important Topics	Types of Mixtures, Colloids vs Suspensions, Separation Techniques
Difficulty Level	Moderate (Requires conceptual clarity)
Exam Weightage	6 - 8 Marks (Very High)

LEARNING OBJECTIVES

After completing this chapter, students will be able to:

- Understand the clear difference between pure substances and mixtures.
- Classify mixtures into **Homogeneous** and **Heterogeneous** categories.
- Differentiate between true solutions, colloids, and suspensions.
- Understand the **Tyndall Effect** and its real-life applications.
- Apply various separation techniques like Evaporation, Centrifugation, Chromatography, and Distillation to separate different mixtures.

KEY CONCEPTS / DEFINITIONS / FORMULAS

Before jumping to the **Class 9 Solutions**, in basic terms ko samajhna bahut zaroori hai. Ratna nahi hai, bas samajhna hai!

- **Pure Substance:** A substance that consists of only one type of particles (atoms or molecules). Example: Gold, Pure Water.
- **Mixture:** A material made up of two or more different substances which are physically combined.
- **Homogeneous Mixture:** A mixture with a uniform composition throughout. (Example: Salt in water).
- **Heterogeneous Mixture:** A mixture with a non-uniform composition. (Example: Sand and iron filings).
- **Solution:** A homogeneous mixture of two or more substances. It has a **solute** (lesser quantity) and a **solvent** (larger quantity).
- **Suspension:** A heterogeneous mixture where solute particles do not dissolve but remain suspended.
- **Colloid:** A heterogeneous mixture whose particles are larger than a true solution but smaller than a suspension. They scatter light (**Tyndall Effect**).
- **Chromatography:** A technique used for the separation of those solutes that dissolve in the same solvent (like colors in a dye).

- **Distillation:** Used to separate two miscible liquids that boil without decomposition and have sufficient difference in their boiling points.

FULL NCERT SOLUTIONS

Here are the detailed, step-by-step **NCERT Solutions for Class 9 Science Chapter 5**. Exam mein exactly aise hi likhna to get full marks!

Question 1: Differentiate between homogeneous and heterogeneous mixtures with examples.

Answer:

- **Homogeneous Mixtures:** These mixtures have a uniform composition throughout their mass. You cannot see the different components separately.
    - *Example:* Sugar dissolved in water, air, alloys.
- **Heterogeneous Mixtures:** These mixtures do not have a uniform composition. The different components can be easily seen.
    - *Example:* Mixture of sand and salt, oil in water, muddy water.

Question 2: How will you separate a mixture containing kerosene and petrol (difference in their boiling points is more than 25°C), which are miscible with each other?

Answer:

We can separate a mixture of kerosene and petrol using the technique of **Simple Distillation** because they are miscible liquids and the difference in their boiling points is more than 25°C.

- **Step 1:** The mixture is taken in a distillation flask and heated.
- **Step 2:** The liquid with the lower boiling point (petrol) will vaporize first.
- **Step 3:** The vapors pass through a condenser, cool down, and are collected in a separate beaker as a liquid.
- **Step 4:** Kerosene, having a higher boiling point, is left behind in the distillation flask.

Question 3: Name the technique to separate:

(i) butter from curd

(ii) salt from sea-water

(iii) camphor from salt.

Answer:

- **(i) Butter from curd:** Centrifugation

- **(ii) Salt from sea-water:** Evaporation (or Crystallization)
- **(iii) Camphor from salt:** Sublimation

Question 4: What type of mixtures are separated by the technique of crystallization?

Answer:

The crystallization technique is used to purify solid mixtures that contain soluble impurities. It separates a pure solid in the form of its crystals from a solution. Example: Obtaining pure copper sulphate crystals from an impure sample, or pure salt from seawater.

Question 5: Classify the following as chemical or physical changes:

- cutting of trees
- melting of butter in a pan
- rusting of almirah
- boiling of water to form steam
  Answer:
- **Physical Changes:** Cutting of trees, melting of butter in a pan, boiling of water to form steam. (Because no new substance is formed).
- **Chemical Changes:** Rusting of almirah. (Because a new chemical compound, rust, is formed).

Question 6: Which of the things around you are pure substances and which are mixtures?

Answer:

- **Pure Substances:** Water, sugar, salt, iron nail, copper wire.
- **Mixtures:** Milk, air, soil, wood, tea.

EXTRA IMPORTANT QUESTIONS (BOARD STYLE 2026)

Exam preparation strong karne ke liye, yahan ExamSpark ke top 15 handpicked questions hain from all difficulty levels.

Multiple Choice Questions (MCQs)

1. Which of the following will show the Tyndall effect?

a) Salt solution

b) Milk

c) Copper sulphate solution

d) Starch solution

Answer: (b) Milk and (d) Starch solution (Both are colloids). (Difficulty: Medium)

2. A mixture of sulphur and carbon disulphide is:

a) Heterogeneous and shows Tyndall effect

b) Homogeneous and shows Tyndall effect

c) Heterogeneous and does not show Tyndall effect

d) Homogeneous and does not show Tyndall effect

Answer: (d) - It forms a true solution. (Difficulty: Hard)

3. Tincture of iodine has antiseptic properties. This solution is made by dissolving:

a) Iodine in potassium iodide

b) Iodine in vaseline

c) Iodine in water

d) Iodine in alcohol

Answer: (d) Iodine in alcohol (Difficulty: Medium)

4. The continuous zig-zag movement of colloidal particles in a dispersion medium is called:

a) Dispersion

b) Tyndall effect

c) Brownian movement

d) Oscillation

Answer: (c) Brownian movement (Difficulty: Easy)

5. Which technique is used in diagnostic laboratories for blood and urine tests?

a) Sublimation

b) Centrifugation

c) Evaporation

d) Chromatography

Answer: (b) Centrifugation (Difficulty: Easy)

Short Answer Questions (2-3 Marks)

6. Define Chromatography and write its one application.

Answer: Chromatography is a technique used to separate solutes that dissolve in the same solvent.

Application: It is used to separate colors in a dye or drugs from blood. (Difficulty: Easy)

7. Why is water called a universal solvent?

Answer: Water is called a universal solvent because it has the ability to dissolve a wide variety of substances (both solids and gases) more than any other liquid.

8. What is the difference between a simple distillation and fractional distillation?

Answer:

- **Simple Distillation:** Used when the difference in boiling points of two miscible liquids is more than 25°C.
- **Fractional Distillation:** Used when the difference in boiling points is less than 25°C. It uses a fractionating column to provide surface area for cooling vapors. (Difficulty: Hard)

9. Explain the Tyndall effect with an everyday example.

Answer: The scattering of a beam of light by colloidal particles is called the Tyndall effect.

Example: When a fine beam of sunlight enters a dark room through a small hole, the dust particles in the air scatter the light, making its path visible.

Long Answer Questions (5 Marks)

10. With the help of a flow diagram, explain the process of obtaining different gases from air.

Answer: Air is a homogeneous mixture and can be separated by fractional distillation.

- **Step 1:** Compress and cool the air by increasing pressure and decreasing temperature.
- **Step 2:** The air turns into liquid air.
- **Step 3:** Allow the liquid air to warm up slowly in a fractional distillation column.
- **Step 4:** Gases separate at different heights based on their boiling points. (Nitrogen at -196°C, Argon at -186°C, Oxygen at -183°C). (Difficulty: Hard)

11. Discuss the process of water purification in waterworks with a block diagram.

Answer: (Students must practice the diagram from NCERT).

1. **Reservoir:** Water is collected here.
2. **Sedimentation Tank:** Heavy solid impurities settle down.
3. **Loading Tank:** Alum is added to settle suspended clay particles.
4. **Filtration Tank:** Water passes through layers of sand and gravel to filter out fine particles.
5. **Chlorination Tank:** Chlorine is added to kill bacteria before supplying to homes. (Difficulty: Hard)

Case-Based Questions

12. Rahul was given an ink marker. He was curious to know if the black ink was made of a single color or a mixture of colors. He put a drop of ink on a strip of filter paper and lowered it into a glass containing water.

a) Which separation technique is Rahul performing? (Ans: Chromatography).

b) What principle is this technique based on? (Ans: Different solubilities of colors in the same solvent).

c) Which color will rise the highest on the paper? (Ans: The color component that is most soluble in water rises faster and highest). (Difficulty: Medium)

13. Sneha bought milk from the market. She passed a laser light through the glass of milk and noticed the path of the light was visible.

a) What type of mixture is milk? (Ans: Colloid).

b) Name the phenomenon observed by Sneha. (Ans: Tyndall Effect). (Difficulty: Easy)

Assertion-Reason Questions

(Options: A- Both A & R are true and R is correct explanation. B- Both A & R are true but R is NOT correct explanation. C- A is true, R is false. D- A is false, R is true.)

14. Assertion (A): A mixture of oil and water can be separated using a separating funnel.

Reason (R): Immiscible liquids separate out in layers depending on their densities.

Answer: (A) Both are true, and R is the exact reason for A. (Difficulty: Medium)

15. Assertion (A): Sugar solution does not show the Tyndall effect.

Reason (R): Sugar solution is a heterogeneous mixture.

Answer: (C) A is true, but R is false. Sugar solution is a homogeneous mixture (true solution), hence its particles are too small to scatter light. (Difficulty: Medium)

COMMON MISTAKES STUDENTS MAKE

Exam checker teachers ke according, Class 9 students usually yeh galti karte hain:

- **Colloid vs Solution:** Bacche Milk ko homogeneous solution samajh lete hain kyunki wo uniform dikhta hai. Remember, **Milk is a colloid** (heterogeneous).
- **Distillation vs Fractional Distillation:** Hamesha yaad rakho, agar boiling point ka difference **less than 25°C** hai (like separating gases from air), toh **Fractional Distillation** use hoga.
- **Evaporation vs Crystallization:** Jab pucha jaye "Which is better?", hamesha **Crystallization** likho kyunki evaporation se solid char (jal sakta hai) ho sakta hai, aur impurities peeche chhut sakti hain.

EXAM PREPARATION TIPS

- **Flowcharts are Key:** Air separation aur Water purification ke flowcharts kam se kam 3 baar draw karke practice karo.
- **Match the Following:** Separation techniques aur unke applications (e.g., Blood test -> Centrifugation) ki ek table bana kar wall par chipka lo.
- **Answer Formatting:** Differences wale questions (Homogeneous vs Heterogeneous) hamesha tabular form mein likho for maximum marks.

FAQ SECTION

Q1: Is Chapter 5 Mixtures important for Class 9 Science boards?

Yes! This chapter carries high weightage and forms the base for Class 11 Chemistry. The separation techniques are frequently asked as 3 or 5-mark questions.

Q2: Where can I get the NCERT PDF Download for Class 9 Science Chapter 5?

You can download the official NCERT textbook PDF from ncert.nic.in, or directly download our complete ExamSpark annotated notes at the bottom of this page.

Q3: What is the most important separation technique for the 2026 exams?

Fractional Distillation (especially separating gases from air) and Chromatography are the highest-probability topics for long-answer questions.

Q4: Why is crystallization considered better than simple evaporation?

Crystallization is better because some solids decompose or get charred upon heating to dryness during evaporation. Also, crystallization removes soluble impurities.

Q5: Are aerosols colloids?

Yes, an aerosol is a colloid in which a solid or liquid is dispersed in a gas. Fog, clouds, and hairspray are common examples.

CONCLUSION

Chemistry ka asli mazaa experiments aur logic mein hai. Jab aapko pata hota hai ki dahi se makkhan kaise nikalta hai (centrifugation) ya black ink mein kitne colors hain (chromatography), toh science interesting ban jati hai!

Make sure to revise these **NCERT Solutions for Class 9 Science Chapter 5** thoroughly. Bookmark this page, practice the extra board-style questions, and download our ExamSpark notes. Study smart, revise regularly, and 2026 board exams mein top karo!

EXTRA SEO OPTIMIZATION (For Backend Use)

1. SEO Meta Title: NCERT Solutions for Class 9 Science Chapter 5 PDF (2026) | Mixtures

2. SEO Meta Description: Get highly detailed NCERT Solutions for Class 9 Science Chapter 5 Exploring Mixtures and Their Separation. Free PDF download, 2026 board questions, & notes!

3. URL Slug: /ncert-solutions-class-9-science-chapter-5-exploring-mixtures-separation

4. Suggested Tags: Class 9 Science Chapter 5, NCERT Solutions Mixtures Class 9, ExamSpark Class 9 Chemistry, NCERT PDF Download Class 9, Exploring Mixtures Important Questions 2026, CUET Foundation.

5. Suggested Internal Linking Ideas:

- Link to "Class 9 Science Chapter 1 Matter Notes" at the beginning of the article.
- Link to "Difference between Homogeneous and Heterogeneous Mixtures Detailed Guide".
- Link to "Best Study Timetable for Class 9 CBSE 2026".
  6. Suggested Featured Snippet Answer (For "What is the principle of centrifugation?"):
  "The principle of centrifugation is that the denser particles are forced to the bottom and the lighter particles stay at the top when spun rapidly. It is commonly used in dairies to separate butter from cream, and in labs for blood and urine tests."

7. JSON-LD FAQ Schema

JSON

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```

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      "text": "Crystallization is better because some solids decompose or get charred upon heating to dryness during evaporation. Also, crystallization removes soluble impurities."
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    "name": "What is the most important separation technique for the 2026 exams?",
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      "text": "Fractional Distillation (especially separating gases from air) and Chromatography are the highest-probability topics for long-answer questions."
    }
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```

8. Breadcrumb Schema

JSON

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    "item": "https://examspark.in/class-9"
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    "name": "Chapter 5 Exploring Mixtures and Their Separation"
  }]
}
```