

## Worksheet: Is Matter Around Us Pure?

NIOS · Class 9 · Science · 15 questions · 39 marks

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Score: \_\_\_\_\_ / 39

**Q1.** Classify each as an element, compound or mixture: (a) Sodium chloride, (b) Brass, (c) Hydrogen, (d) Sugar solution. *[1 mark]*

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**Q2.** In 50 g of a salt solution containing 5 g of salt, identify the solute, solvent and the mass of solvent. *[1 mark]*

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**Q3.** Why is the Tyndall effect seen in fog but not in salt solution? *[1 mark]*

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**Q4.** Name the property that distinguishes a suspension from a colloid. *[1 mark]*

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**Q5.** Name the separation technique you would use to separate: (a) cream from milk, (b) iron filings from sand, (c) salt from sea water, (d) the dyes in a black-ink sample. *[2 marks]*

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**Q6.** A solution contains 40 g of sugar dissolved in 360 g of water. Calculate the mass percentage of the solution. *[2 marks]*

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**Q7.** You're told a sugar solution is 15% sugar by mass and you need 60 g of sugar. How much water should you add? [3 marks]

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**Q8.** Classify each as solution, colloid or suspension AND justify with one observation: (a) Soap-water lather, (b) Sand stirred in water, (c) Sugar in water. [3 marks]

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**Q9.** Why is the Tyndall effect more visible through a forest canopy in the early morning than at noon? Justify with two reasons. [3 marks]

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**Q10.** Two miscible liquids A and B have boiling points 56 °C and 78 °C respectively. Which separation technique would you choose, and why? [3 marks]

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**Q11.** Why is fractional distillation, not simple distillation, used to separate gases of liquefied air? [3 marks]

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**Q12.** Iron and sulphur are mixed in a 7:4 mass ratio and (a) stirred together, (b) heated strongly. Compare the products with respect to colour, magnetism and the effect of dilute  $\text{H}_2\text{SO}_4$ . [4 marks]

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**Q13.** You're given a mixture of common salt (NaCl), ammonium chloride (NH<sub>4</sub>Cl) and sand. Design a stepwise process to get all three components pure. *[4 marks]*

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**Q14.** 300 g of a sugar solution at 60 °C contains 60 g of sugar. (a) Find its mass percentage. (b) If cooled to room temperature 18 g of sugar separates out (crystallises), find the mass percentage of the saturated solution at room temperature. *[4 marks]*

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**Q15.** In a petroleum refinery, why is crude oil fractionally distilled in a tall column rather than batch-distilled, and what does the column's height correspond to physically? *[4 marks]*

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