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]*

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

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

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

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]*

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

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]*

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]*

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]*

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]*

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

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 H_2SO_4. *[4 marks]*

Q13. You're given a mixture of common salt (NaCl), ammonium chloride (NH₄Cl) and sand. Design a stepwise process to get all three components pure. *[4 marks]*

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]*

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]*