

Intermediate Science 7

Unit 3: Mixtures and Solutions

Study Guide For Test 1



Know the following:

Particle Theory of Matter	Chemistry	Properties
Matter	Elements	Compounds
Mixture	Heterogeneous Mixture	Mechanical Mixture
Homogeneous Mixture	Solution	Pure Substance
Solute	Solvent	Dissolve
Solubility	Soluble	Insoluble
Concentration	Qualitative	Concentrated
Dilute	Quantitative	Saturated
Unsaturated	Mechanical Sorting	Filtration
Evaporation	Distillation	Simple Distillation
Fractional Distillation	Paper Chromatography	Petroleum
Colligative Property		

Know the following:

- Using observations, categorize substances as pure or mixtures
- Define the terms pure substance and mixture using the particle theory of matter
- Identify examples of various pure substances, including:
 - distilled water (H_2O)
 - sugar ($C_{12}H_{22}O_{11}$)
 - copper (Cu)
 - oxygen (O_2)
 - carbon dioxide (CO_2)
- Identify examples of various mixtures that are found in or around student homes, including:
 - salad dressing
 - chocolate chip cookie
 - Kool-Aid
 - concrete
 - air
- Identify that homogeneous mixtures appear as one substance and light will pass through unaffected
- Identify that heterogeneous mixtures may appear as one substance and light will scatter as it passes through
- Identify some mixtures as combinations of heterogeneous and homogeneous mixtures, including:
 - orange juice
 - milk
 - soft drink

8. Define:
- (i) dissolving
 - (ii) solute
 - (iii) solvent
 - (iv) solubility (soluble/ insoluble)
9. Identify that solutions can form between the three states of matter, including:
- (i) solid solute - liquid solvent
 - (ii) gas solute - liquid solvent
 - (iii) gas solute - gas solvent
 - (iv) solid solute - solid solvent
 - (v) liquid solute - liquid solvent
10. Given an example of a solution and its components, identify the solute and solvent
11. Define:
- (i) concentrated
 - (ii) dilute
 - (iii) concentration
12. Distinguish between concentrated and dilute solutions
13. Describe the concentrations of solutions qualitatively using the terms:
- (i) saturated
 - (ii) unsaturated
 - (iii) dilute
 - (iv) concentrated
14. Describe the concentrations of solutions quantitatively as the amount of solute per unit volume, including:
- (i) g/L
 - (ii) percentage by mass
 - (iii) ppm (parts per million)
15. Describe qualitatively the factors that affect the solubility of a solid and a gas, including:
- (i) temperature
 - (ii) pressure
16. Describe how to use different methods to separate a variety of mixtures, including:
- (i) mechanical sorting(flotation, magnetism)
 - (ii) filtration
 - (iii) evaporation
 - (iv) distillation
 - (v) paper chromatography
17. Identify common separation techniques used to separate the components of a variety of mixtures, including:

- (i) straining spaghetti in a colander
 - (ii) skimming fat off soup
 - (iii) drying clothes (separating water from fabric)
 - (iv) window screens allowing air in while keeping insects out
 - (v) making coffee using ground coffee beans
18. Define distillation
19. Explain how a distillation apparatus is used to separate a solution
20. Describe where boiling, evaporation and condensation occurs in a distillation apparatus
21. Using distillation as an example show how refining and separation techniques have evolved, including:
- (i) simple distillation
 - (ii) fractional distillation
22. Identify some positive and negative effects and intended and unintended consequences of using salt on highways
23. Describe how our understanding of the properties of solutions has resulted in better road deicing technologies
24. Make an informed decision about the use of road salt as our main road de-icing chemical taking into account the environmental, social, and economic advantages and disadvantages

