Recrystallization Experiment – Exam Questions

Part A: Multiple Choice Questions (Circle the correct answer)

1. Recrystallization is mainly used to:

A) Separate liquids

B) Purify solid organic compounds

C) Distill volatile compounds

D) Analyze unknown solutions

2. The principle of recrystallization depends mainly on:

A) Density differences

B) Solubility changes with temperature

C) Electrical conductivity

D) Vapor pressure

3. In recrystallization, the impure solid is first:

A) Cooled rapidly

B) Dissolved in a minimal amount of hot solvent

C) Filtered immediately

D) Mixed with cold solvent

4. During recrystallization, impurities usually:

A) Crystallize first

B) Remain dissolved in the solvent

C) Evaporate

D) Form gases

5. Crystallization differs from precipitation because crystallization:

A) Occurs very rapidly

B) Forms an amorphous solid

C) Produces a well-ordered crystal lattice

D) Does not remove impurities

6. Precipitation generally results in:

A) Pure crystals

B) Highly ordered lattice

C) Amorphous solid with trapped impurities

D) Liquid product

7. Which step comes first in recrystallization?

A) Cooling the solution

B) Washing the crystals

C) Choosing a suitable solvent

D) Drying the product

8. Why is hot solvent used in recrystallization?

A) To decrease solubility

B) To increase solubility of the solid

C) To evaporate impurities

D) To cool the solution

9. After dissolving the solid in hot solvent, the next step is usually:

A) Cooling immediately

B) Filtering insoluble impurities

C) Adding acid

D) Evaporating the solvent

10. Crystals are formed when the solution:

A) Is heated

B) Is stirred continuously

C) Is cooled slowly

D) Is filtered

11. Slow cooling during recrystallization helps:

A) Trap impurities

B) Produce larger and purer crystals

C) Prevent crystallization

D) Decompose the compound

12. The solvent used in recrystallization should be:

A) Reactive with the compound

B) Highly soluble at all temperatures

C) Highly soluble when hot but poorly soluble when cold

D) Insoluble at all temperatures

13. Which property is desirable for a recrystallization solvent?

A) High boiling point and non-volatile

B) Low volatility

C) Volatile and easily removed

D) Strongly reactive

14. The solvent must not:

A) Dissolve the compound

B) React with the compound

C) Evaporate

D) Be heated

15. Impurities during recrystallization should ideally:

A) Crystallize first

B) Remain dissolved in solvent

C) Decompose

D) Become solid immediately

16. The main purpose of washing the crystals is to:

A) Increase crystal size

B) Remove residual impurities

C) Dissolve the crystals

D) Increase solvent volume

17. Minimal solvent is used to:

A) Reduce solubility

B) Ensure complete crystallization

C) Increase boiling point

D) Prevent heating

18. Which solvent is listed in the experiment table for solubility testing?

A) Ether

B) Water

C) Benzene

D) Hexane

19. Which of the following is also tested as a solvent in the experiment?

A) Methanol

B) Alcohol

C) Chloroform

D) Toluene

20. Another solvent tested in the report sheet is:

A) Acetone

B) Ether

C) Hexane

D) Benzene

21. Solubility testing is performed in:

A) Only hot solvent

B) Only cold solvent

C) Both cold and hot solvent

D) Neutral solvent

22. The goal of recrystallization is to obtain:

A) Liquid compound

B) Gas product

C) Pure crystalline solid

D) Colloidal suspension

23. If a compound is soluble in cold solvent, the solvent is:

A) Ideal for recrystallization

B) Unsuitable for recrystallization

C) Always preferred

D) Required for filtration

24. Which factor is essential for obtaining pure crystals?

A) Rapid precipitation

B) Slow crystallization

C) Immediate filtration

D) High pressure

25. The purified compound after recrystallization is usually collected by:

A) Distillation

B) Filtration

C) Evaporation

D) Sublimation

Part B: Calculation Questions (Essay)

26. A student started with 5.00 g of crude unknown compound. After recrystallization, the purified compound weighed 3.80 g. Calculate the percentage yield.

27. In another experiment, the mass of crude compound was 4.5 g. After recrystallization, the purified mass was 3.15 g. Calculate the % yield and show the formula.

Answer Key

1-B

2-B

3-B

4-B

5-C

6-C

7-C

8-B

9-B

10-C

11-B

12-C

13-C

14-B

15-B

16-B

17-B

18-B

19-B

20-A

21-C

22-C

23-B

24-B

25-B

26. Percentage Yield Calculation: % Yield = (Mass of purified compound / Mass of crude compound) × 100 = (3.80 g / 5.00 g) × 100 = 0.76 × 100 = 76 %

27. Percentage Yield Calculation: % Yield = (Mass of purified compound / Mass of crude compound) × 100 = (3.15 g / 4.5 g) × 100 = 0.70 × 100 = 70 %