

Paper Chromatography Chemistry Questions with Solutions

Q1. Paper Chromatography is a separatory technique that is used to separate_____

- (a) Simple mixtures
- (b) Complex mixtures
- (c) Viscous mixtures
- (d) Metals

Answer: (b) Paper Chromatography is a separatory technique that is used to separate complex mixtures.

Q2. Which of the following is used as a spraying reagent in paper chromatography?

- (a) Concentrated hydrochloric acid solution
- (b) Sodium chloride solution
- (c) Ninhydrin solution
- (d) Copper sulphate solution

Answer: (c) Ninhydrin is used as a spraying reagent in paper chromatography.

Q3. Which of the following is not a development technique in paper chromatography?

- (a) High-Pressure Liquid Chromatography
- (b) Ascending Chromatography
- (c) Descending Chromatography
- (d) Two-Dimensional Chromatography

Answer: (a) High-Pressure Liquid Chromatography is not a development technique in paper chromatography.

Q4. The pattern on the paper in Paper chromatography is called_____

- (a) Chroma
- (b) Chromatograph
- (c) Chroming
- (d) Chromatogram

Answer: (d) The pattern on the paper in Paper chromatography is called chromatogram.

Q5. A combination of paper chromatography and electrophoresis involves_____

- (a) Electrical mobility of the ionic species
- (b) Partition chromatography

- (c) Both (a) and (b)
(d) None of the above

Answer: (c) A combination of paper chromatography and electrophoresis involves electrical mobility of the ionic species and partition chromatography.

Q6. What is paper chromatography?

Answer: Paper chromatography is an analytical method used to separate dissolved chemical substances by taking the benefit of different migration rates across sheets of paper.

Q7. What are the applications of chromatography?

Answer: There are miscellaneous applications of paper chromatography.

1. It is used to study the process of fermentation and ripening.
2. It is used to specify drugs and dopes.
3. It is used to detect impurities.
4. It is used to check the purity of medicines.
5. It is used to review makeup and cosmetics.

Q8. What is R_f value?

Answer: R_f value is the ratio of the distance travelled by the solute to the distance travelled by the solvent.

$$R_f = \frac{\text{Distance travelled by the solute}}{\text{Distance travelled by the solvent}}$$

Q9. What are the moving and stationary phases in paper chromatography?

Answer: Water absorbed on the cellulose, constituting the paper, works as a stationary phase while the organic solvent works as a moving phase in the paper chromatography.

Q10. What are the advantages of paper chromatography?

Answer: There are miscellaneous advantages of paper chromatography.

1. It is affordable and relatively easier than other methods.
2. It is time-efficient.
3. It needs a nominal quantity of samples for testing.
4. It is relatively effortless to set up and handle.
5. It is susceptible.
6. It can separate both organic and inorganic substances.

Q11. What are the disadvantages of paper chromatography?

Answer: There are miscellaneous disadvantages of paper chromatography.

1. It is tough to separate the complex mixtures by paper chromatography.
2. It is incompatible for testing large quantities of samples.
3. It can not separate volatile compounds.
4. It is not suitable for quantitative analysis.

5. It is not accurate as high-pressure liquid chromatography and thin-layer chromatography.
6. We can not separate chromatograms for a long time period.

Q12. How does the liquid rise through a filter paper in paper chromatography?

Answer: The liquid rise through a filter paper in paper chromatography by the mean of the capillary action.

Q13. What are the various factors that affect the R_f value of a compound?

Answer: R_f value of a compound depends on the following factors.

1. Temperature of the surroundings
2. Nature of the compound
3. Nature of the solvent.

Q14. What are the fundamental features of the compound used as a developer?

Answer: The fundamental features of the compound used as a developer are enlisted below.

1. The compound should not react with the substances that are being separated.
2. The compound should be volatile.
3. The compound must impart colour at separate spots.

Q15. In which of the following type of paper chromatography does the mobile phase move horizontally over a circular sheet of paper?

- (a) Ascending – descending chromatography
- (b) Ascending paper chromatography
- (c) Descending paper chromatography
- (d) Radial paper chromatography

Answer: (d) In radial paper chromatography, the mobile phase move horizontally over a circular sheet of paper.

Practise Questions on Paper Chromatography

Q1. What is the size of the spot in paper chromatography?

- (a) 1 - 2 mm
- (b) 2 - 5 mm
- (c) 6 - 8 mm
- (d) 7 - 8 mm

Answer: (b) The size of the spot in paper chromatography should be between two to five mm.

Q2. What are the limitations of paper chromatography?

Answer: Paper Chromatography is a very cheap, susceptible and straightforward technique, but we can not apply a large quantity of samples to paper chromatography. In a quantitative analysis, paper chromatography is not practical. A complex mixture cannot be separated by paper chromatography.

Q3. What does paper chromatography depend on?

Answer: Paper chromatography depends upon two non-mixing liquid phases, the solvent and the water bound to the cellulose molecules of the filter paper. When a substance soluble in the two non-mixing solvents is exposed simultaneously to both, it will partition itself between them. The process in which substances move in one medium when placed in another medium is called partitioning.

Q4. Why water is not used in paper chromatography?

Answer: Water is polar, so any non-polar substance dissolved in it will dissolve in the water. When the water travels up the paper, it will take any non-polar substance dissolved in it with it. This means that if you were trying to separate a mixture of non-polar and polar substances, they would all travel up the paper together, and you wouldn't be able to tell which was which. The problem here is that all compounds dissolve equally well in water, so many of your compounds would remain in the aqueous layer on top of the stationary layer and not move at all.

Q5. Which of the following types of chromatography involves the process where the mobile phase moves through the stationary phase by the influence of gravity or capillary action?

- (a) Column Chromatography
- (b) High-Pressure Liquid Chromatography
- (c) Gas Chromatography
- (d) Paper Chromatography

Answer: (d) In Paper Chromatography, the stationary phase is supported on a flat plate of paper. The mobile phase moves by the influence of gravity or capillary action.