

PROPERTIES OF ORGANIC COMPOUNDS – TEST 1

QUESTION 1

The best description of a functional group is

- A a group of atoms unique to a molecule
- B an atom or group of atoms that changes the polarity of a molecule
- C an atom or group of atoms that alters the properties and reactivity of a molecule
- D a molecule that contains atoms other than carbon and hydrogen

QUESTION 2

The organic compound with the highest boiling point is:

- A Ethylene (ethene)
- B Acetic Acid (ethanoic acid)
- C Chloroethane
- D Ethanol

QUESTION 3

Chloroethane is produced by mixing ethane and chlorine in the presence of heat or light. If sufficient concentrations of chlorine are used, a mixture of products can be produced which would require separation by distillation in order to obtain pure chloroethane.

Which of the following products from the chlorination of ethane would be distilled last?

- A 1-chloroethane
- B 1,1-dichloroethane
- C 1,1,2-trichloroethane
- D 1,1,2,2-tetrachloroethane

QUESTION 4

The organic compound with the lowest solubility in octane is

- A Butanol
- B Decanol
- C Hexanol
- D Octanol

QUESTION 5

The species with the lowest solubility in water is

- A Decanoic acid
- B Ethanoic acid
- C Pentanoic acid
- D Propanoic acid

QUESTION 6

An homologous series is

- A a group of molecules with the same functional group
- B a group of molecules that differ by CH_2
- C a group of molecules with the identical properties
- D a group of molecules that exist in the same state at room temperature

QUESTION 7

Order the following molecules from least polar to most polar: ethane, ethanoic acid, methyl methanoate, ethanol.

- A ethanoic acid, ethanol, methyl methanoate, ethane
- B ethane, ethanol, methyl methanoate, ethanoic acid
- C methyl methanoate, ethane, ethanol, ethanoic acid
- D ethane, methyl methanote, ethanol ethanoic acid.

QUESTION 8

Which of the following does not have acid-base properties?

- i. propanoic acid
- ii. propanol
- iii. propanamide
- iv. chloropropane

- A ii
- B iv
- C ii & iv
- D ii, iii & iv

QUESTION 9

Which statement is incorrect about the members of a homologous series?

- A As the molecular weight of the molecule increases, so does the strength of the intermolecular forces.
- B All the members of a homologous series that can hydrogen bond are soluble.
- C As the molecular weight of the molecule increases, the volatility decreases.
- D Some of the properties of a homologous series gradually change as the molecular weight increases.

SOLUTIONS

QUESTION 1 Answer is C

QUESTION 2 Answer is B

The highest boiling point will occur in the compound with the strongest intermolecular forces.

Carboxylic acid > Alcohol > Hydrocarbon

QUESTION 3 Answer is D

The greater the number of chlorine atoms on the ethane molecule, the greater the net strength forces between molecules and therefore, the higher the boiling points. The lowest boiling point fraction would be extracted first during distillation (1-chloroethane) and then the next highest boiling point and so on.

QUESTION 4 Answer is A

The organic compound with the lowest solubility in octane is the species that has the shortest chain length i.e. A.

QUESTION 5 Answer is A

Decanoic acid has the lowest chain length hence the lowest solubility in water.

QUESTION 6 Answer is B

QUESTION 7 Answer is D

QUESTION 8 Answer is B

QUESTION 9 Answer is B