

Chemistry Questions and Answers – Inductive Effect

1. Electronegativity is defined as the power of an atom in a molecule to _____

- a) Repel electrons towards itself
- b) Attract electrons towards itself
- c) Expand itself
- d) All of the mentioned

Answer: b

Explanation: Electronegativity is defined as the power of an atom in a molecule to attract electrons towards itself. Fluorine is the most electronegative element.

2. The factors on which electronegativity depends upon _____

- a) Valence state of atom
- b) Hybridisation
- c) Both valence state and hybridisation
- d) None of the mentioned

Answer: c

Explanation: The factors on which electronegativity depends upon is valence state of atom and hybridisation.

3. How does the electronegativity get affected with the negative oxidation state?

- a) It decreases
- b) It increases
- c) It remains constant
- d) None of the mentioned

Answer: a

Explanation: Electronegativity decreases with the negative oxidation state since the tendency to attract an electron will decrease with the negative charge of the anion.

4. The electronegativity of sp^2 hybridised atom will be _____

- a) 3.29
- b) 2.48
- c) 3.69
- d) 2.75

Answer: d

Explanation: The electronegativity of sp^2 hybridised atom will be 2.75. Fluorine is the most electronegative element.

5. Which of the following is a permanent electron displacement effect?

- a) Inductomeric
- b) Electromeric
- c) Inductive
- d) All of the mentioned

Answer: c

Explanation: Inductive effect is the permanent electron displacement effect and inductomeric and electromeric are temporary electron displacement effects.

6. Arrange the following groups in the order of decreasing (+I) effect.

- a) $C_6H_5O^- > COO^- > CR_3 > CHR_2 > H$
- b) $C_6H_5O^- > H > CR_3 > CHR_2 > COO^-$
- c) $CR_3 > C_6H_5O^- > H > COO^- > CHR_2$

d) $C_6H_5O^- > COO^- > CHR_2 > CR_3 > H$

Answer: a

Explanation: The correct order is- $C_6H_5O^- > COO^- > CR_3 > CHR_2 > H$.

7. Arrange the following groups in the order of decreasing (-I) effect.

a) $CN > F > Br > Cl > COOH > I > H$

b) $COOH > CN > F > Br > Cl > I > H$

c) $H > COOH > CN > I > Cl > F > Cl$

d) $CN > COOH > F > Cl > Br > I > H$

Answer: d

Explanation: The correct order is- $CN > COOH > F > Cl > Br > I > H$.

8. Which of the following is an application of inductive effect?

a) Bond length

b) Dipole moment

c) Strength of carboxylic acids

d) All of the mentioned

Answer: d

Explanation: Bond length, dipole moment and strength of carboxylic acids are some of the applications of inductive effect.

9. Relative basic strength of amines does not depend upon _____

a) Inductive effect

b) Mesomeric effect

c) Steric effect

d) Stabilisation of cation by hydration

Answer: b

Explanation: Relative basic strength of amines does not depend upon mesomeric effect. This effect is used in a qualitative way and describes the electron withdrawing or releasing properties of substituents based on relevant resonance structures.

10. Due to presence of C – X polar bond in alkyl halide, alkyl halides are _____

a) More reactive than corresponding alkane

b) Less reactive than corresponding alkane

c) Equally reactive as corresponding alkane

d) None of the mentioned

Answer: a

Explanation: Due to the presence of C – X polar bond in alkyl halide, alkyl halides are more reactive than corresponding alkane.

Chemistry Questions and Answers – Electromeric Effect

1. Which of the following is a temporary effect brought into play at the requirement of attacking reagent?

a) Inductive effect

b) Mesomeric effect

c) Electromeric effect

d) Inductomeric effect

Answer: c

Explanation: Electromeric effect is a temporary effect brought into play at the requirement of attacking reagent. Electromeric effect refers to a molecular polarizability effect occurring by an intra-molecular electron displacement.

2. Select the correct statement from the following option.

- a) When multiple bonds are present between two different atoms, electromeric shift towards the more electronegative atom takes place
- b) When multiple bonds are present between two similar atoms, the first possibility is symmetric alkenes or alkynes
- c) When multiple bonds are present between two similar atoms, the second possibility is asymmetric alkenes or alkynes
- d) All of the mentioned

Answer: d

Explanation: When multiple bonds are present between two different atoms, electromeric shift towards the more electronegative atom takes place. When multiple bonds are present between two similar atoms, the first possibility is symmetric alkenes or alkyne and the second possibility is asymmetric alkenes or alkynes.

3. Select the correct statement from the following option.

- a) Conjugate effect is stronger than (-I) effect
- b) Conjugate effect is weaker than (-I) effect
- c) Conjugate effect is same as (-I) effect
- d) None of the mentioned

Answer: a

Explanation: Conjugate effect is stronger than (-I) effect. Conjugate effect (or delocalization) is an effect in which molecular orbitals (MOs) are conjugated to new molecular orbitals that are more delocalized and therefore generally lower in energy.

4. When the complete transfer of π -electrons take place away from the atom at the requirement of attacking agent, it is called _____

- a) (-E) effect
- b) (+E) effect
- c) (-I) effect
- d) (+I) effect

Answer: b

Explanation: When the complete transfer of π -electrons takes place away from the atom at the requirement of attacking agent, it is called (+E) effect.

5. The positively charged and electron deficient compounds which have a tendency to form a bond by accepting the electron pair are known as _____

- a) Electrophiles
- b) Nucleophiles
- c) Homophiles
- d) All of the mentioned

Answer: a

Explanation: The positively charged and electron deficient compounds which have a tendency to form a bond by accepting the electron pair are known as electrophiles.

6. Which of the following is an example of lewis base?

- a) ZnCl_2
- b) BF_3

- c) NH_3
- d) FeCl_2

View Answer

Explanation: NH_3 is an example of lewis base and ZnCl_2 , BF_3 and FeCl_2 are the examples of lewis acid.

7. Which of the following is an incorrect statement about the nucleophiles?

- a) They are electron rich
- b) They possess an empty orbital to receive the electron pair
- c) They attack electron deficient centres
- d) Examples are: OH^- , NH_3 , H_2O etc

View Answer

Explanation: Nucleophiles possess an unshared electron pair which is not firmly held to the nucleus. All the other options are correct. They are electron rich and attack on electron deficient centres. Examples are: OH^- , NH_3 , H_2O etc.

8. Lewis acids are examples of nucleophilic reagents.

- a) True
- b) False

View Answer

Explanation: Lewis acids are the examples of electrophilic reagents and Lewis bases are the examples of nucleophilic reagents.

9. Those groups which are electron repelling and have lesser electron attracting power than hydrogen show _____

- a) (+E) effect
- b) (-E) effect
- c) (-I) effect
- d) (+I) effect

View Answer

Answer: d

Explanation: Those groups which are electron repelling and have lesser electron attracting power than hydrogen show (+I) effect.

10. Which of the following molecule will show highest dipole moment?

- a) CH_3Cl
- b) CH_3Br
- c) CH_3F
- d) CH_3I

View Answer

Explanation: CH_3F will show the highest dipole moment because it is the most electronegative compound.