

**QB365 Question Paper Software**  
**11th Standard - Chemistry**  
**Chemical Bonding and Molecular Structure Assertion and reason**

Exam Time: 00:20 Hrs

Date: 2025-10-11

Total Marks: 10

**Questions:**

**Assertion and reason**

1. **Assertion:** Among the two O-H bonds in  $H_2O$  molecule, the energy required to break the first O-H bond and the other O-H bond is the same.

**Reason:** This is because the electronic environment around oxygen is the same even after breakage of one O-H bond.

**Codes:**

- (a) Both Assertion and Reason. are true and Reason is the correct explanation of Assertion.
- (b) Both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
- (c) Assertion is true but Reason is false.
- (d) Both Assertion and Reason are false.

2. **Assertion:** The molecular orbitals with higher energy is called anti bonding orbitals.

**Reason:** The anti bonding nature of a molecular orbital is indicated by an asterisk over its designation.

**Codes:**

- (a) Both Assertion and Reason. are true and Reason is the correct explanation of Assertion.
- (b) Both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
- (c) Assertion is true but Reason is false.
- (d) Both Assertion and Reason are false.

3. **Assertion:** Ionic compounds usually have high melting and boiling points.

**Reason:** A large amount of energy is needed to overcome the strong interionic electrostatic attractive forces.

**Codes:**

- (a) Both Assertion and Reason. are true and Reason is the correct explanation of Assertion.
- (b) Both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
- (c) Assertion is true but Reason is false.
- (d) Both Assertion and Reason are false.

4. **Assertion:** Sodium chloride formed by the action of chlorine gas on sodium metal is a stable compound.

**Reason:** This is because sodium and chloride ions acquire octet in sodium chloride formation.

**Codes:**

- (a) Both Assertion and Reason are true and Reason is the correct explanation of Assertion.

(b) Both Assertion and Reason are true but Reason is not the correct explanation of Assertion.

(c) Assertion is true but Reason is false.

(d) Both Assertion and Reason are false.

5. **Assertion** :  $\text{BF}_3$  molecule has zero dipole moment.

**Reason** : F is electronegative and B-F bonds are polar in nature.

**Codes:**

(a) Assertion is correct, reason is correct; reason is a correct explanation for assertion.

(b) Assertion is correct, reason is correct; reason is not a correct explanation for assertion

(c) Assertion is correct, reason is incorrect

(d) Assertion is incorrect, reason is correct.

6. **Assertion** :  $\text{CH}_2\text{Cl}_2$  is non-polar and  $\text{CCl}_4$  is polar molecule.

**Reason** : Molecule with zero dipole moment is non-polar in nature.

**Codes:**

(a) Assertion is correct, reason is correct; reason is a correct explanation for assertion.

(b) Assertion is correct, reason is correct; reason is not a correct explanation for assertion

(c) Assertion is correct, reason is incorrect

(d) Assertion is incorrect, reason is correct.

7. **Assertion** : Water is one of the best solvent.

**Reason** : H-bonding is present in water molecules.

**Codes:**

(a) Assertion is correct, reason is correct; reason is a correct explanation for assertion.

(b) Assertion is correct, reason is correct; reason is not a correct explanation for assertion

(c) Assertion is correct, reason is incorrect

(d) Assertion is incorrect, reason is correct.

8. **Assertion** : Shape of  $\text{NH}_3$  molecule is tetrahedral.

**Reason** : In  $\text{NH}_3$  nitrogen is  $\text{sp}^3$  hybridized.

**Codes:**

(a) Assertion is correct, reason is correct; reason is a correct explanation for assertion.

(b) Assertion is correct, reason is correct; reason is not a correct explanation for assertion

(c) Assertion is correct, reason is incorrect

(d) Assertion is incorrect, reason is correct.

9. **Assertion** : Atoms can combine either by transfer of valence of electrons from one atom to another or by sharing of valence electrons.

**Reason** : Sharing and transfer of valence electrons is done by atoms to have an octet in their valence shell.

**Codes:**

(a) Assertion is correct, reason is correct; reason is a correct explanation for assertion.

(b) Assertion is correct, reason is correct; reason is not a correct explanation for assertion

(c) Assertion is correct, reason is incorrect

(d) Assertion is incorrect, reason is correct.

10. **Assertion :** Shape of  $\text{NH}_3$  molecule is tetrahedral.

**Reason :** In  $\text{NH}_3$  nitrogen is  $\text{sp}^3$  hybridized.

**Codes:**

- (a) Assertion is correct, reason is correct; reason is a correct explanation for assertion.
- (b) Assertion is correct, reason is correct; reason is not a correct explanation for assertion
- (c) Assertion is correct, reason is incorrect
- (d) Assertion is incorrect, reason is correct.

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## Answers Key:

### Assertion and reason

- 1. (d) Both Assertion and Reason are false
- 2. (b) Both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
- 3. (a) Both Assertion and Reason are true and Reason is the correct explanation of Assertion.
- 4. (a) Both Assertion and Reason are true and Reason is the correct explanation of Assertion.
- 5. (b) Assertion is correct, reason is correct; reason is not a correct explanation for assertion
- 6. (d) Assertion is incorrect, reason is correct.
- 7. (b) Assertion is correct, reason is correct; reason is not a correct explanation for assertion

### Explanation:

Water is excellent solvent because it has high value of dielectric constant. Due to high value of dielectric constant, the electrostatic force of attraction between the ions decrease and these ions get separated and ultimately get solvated by the solvent molecules.

- 8. (d) Assertion is incorrect, reason is correct.

### Explanation:

$\text{NH}_3$  molecule is pyramidal is shape, because out of four electron pairs, three are bonding pairs and one is lone pair.

- 9. (a) Assertion is correct, reason is correct; reason is a correct explanation for assertion.

### Explanation:

Atoms combine either by transfer of valence electrons from one atom to another or by sharing of valence electrons to have an octet in their valence shell.

- 10. (d) Assertion is false but reason is true.

### Explanation:

$\text{NH}_3$  molecule is pyramidal is shape, because out of four electron pairs, three are bonding pairs and one is lone pair.