

Chemical Bonding and Molecular Structure

1. **Assertion (A):** CO₂ is resonance stabilized molecule.
Reason (R): Bond length of C—O in CO₂ is intermediate of single and double bond length
- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
 - (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
 - (3) (A) is true but (R) is false
 - (4) Both (A) and (R) are false
2. **Assertion (A):** Each molecule of H₂O forms four H—Bond in the form of ice.
Reason (R): Ice is solid state of H₂O.
- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
 - (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
 - (3) (A) is true but (R) is false
 - (4) Both (A) and (R) are false
3. **Assertion (A):** Both methane and tetrachloromethane are nonpolar.
Reason (R): C—Cl bond is polar bond.
- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
 - (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
 - (3) (A) is true but (R) is false
 - (4) Both (A) and (R) are false
4. **Assertion (A):** N₂ is more stable than N₂⁺.
Reason (R): Bond order of N₂ is 3 while N₂⁺ is 2.5.
- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
 - (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
 - (3) (A) is true but (R) is false
 - (4) Both (A) and (R) are false
5. **Assertion (A):** Lattice energy of CaO is higher than LiCl.
Reason (R): Lattice energy of ionic compound is directly proportional to the product of charges of ion.
- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
 - (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
 - (3) (A) is true but (R) is false
 - (4) Both (A) and (R) are false
6. **Assertion (A):** All P—Cl bond lengths are equal in PCl₃ but different in PCl₅
Reason (R): Hybrid state of central atom is different in Both molecules.
- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
 - (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
 - (3) (A) is true but (R) is false
 - (4) Both (A) and (R) are false



7. **Assertion (A):** Equal number of sigma and pi bonds are present in ethyne.

Reason (R): π bond is stronger than σ bond

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false

8. **Assertion (A):** Bond order of H_2^+ is 0.5.

Reason (R): Electrons are removed from the antibonding molecular orbital from H_2 .

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false

9. **Assertion (A):** LiCl is more covalent than $BeCl_2$.

Reason (R): Li^+ ion is smaller than Be^{2+} .

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false

10. **Assertion (A):** O_2 is paramagnetic

Reason (R): N_2 is paramagnetic

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false

11. **Assertion (A):** PCl_5 exist but NCl_5 does not.

Reason (R): Nitrogen is highly inert

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false

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

Reason (R): This is because sodium and chloride ions acquire octet in sodium chloride formation.

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false

13. **Assertion (A):** O_2 is paramagnetic in nature.

Reason (R): According to molecular orbital theory, it contains unpaired electrons, so it is paramagnetic.

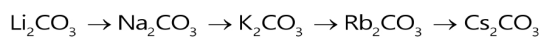
- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
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- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false



14. **Assertion (A):** The order of thermal stability of



Reason (R): As we go



, ionic character of carbonates increases.

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false

15. **Assertion (A):** Among two cations of similar size, the polarising power of cation with pseudo noble gas configuration is larger than cation with noble gas configuration.

Reason (R): Polarising power of Ag^+ is more than K^+

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
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- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false

16. **Assertion (A):** In PF_3Cl_2 , fluorine occupy axial position and chlorine occupy equatorial position.

Reason (R): F is smaller in size than Cl

- (1) Both (A) & (R) are true and the (R) is the correct explanation of the (A)
- (2) Both (A) & (R) are true but the (R) is not the correct explanation of the (A)
- (3) (A) is true but (R) is false
- (4) Both (A) and (R) are false

ANSWER KEY

Que.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ans.	3	2	2	1	1	2	4	3	4	3	2	1	1	1	2	1

