

Bond Characteristics

1. The O–H bond length in H₂O is xA⁰. The O–H bond length in H₂O₂ is

- 1) < xA⁰ 2) xA⁰ 3) > xA⁰ 4) 2x

2. The C–C bond distance is largest in

- 1) C₂H₂ 2) C₂H₄ 3) C₂H₂Br₂ 4) C₂H₆

3. Bond polarity is least in

- 1) N–H 2) O–H 3) H–F 4) C–H

4. Bond energy is highest in the molecule

- 1) F₂ 2) Br₂ 3) I₂ 4) Cl₂

5. Bond energy of C–C bond is highest in

- 1) H₃C–CH₃ 2) H₂C=CH₂ 3) CH≡CH 4) C₂H₅Cl

6. Bond energy is highest in the overlapping

- 1) sp³–s 2) sp²–s 3) sp–s 4) Equal in all

7. Bond energy is least in the following

- 1) HF 2) HCl 3) HBr 4) HI

8. The highest bond energy is in



9. Which of the following has least bond energy?

- 1) F₂ 2) H₂ 3) N₂ 4) O₂

10. Which of the following hydrocarbon has least C-C bond length?

- 1) C_2H_6 2) C_2H_4 3) C_6H_6 4) C_2H_2

11. The correct order of bond lengths is

- 1) $\text{H}-\text{Cl} > \text{H}-\text{Br} > \text{H}-\text{I}$ 2) $\text{H}-\text{I} > \text{H}-\text{Br} > \text{H}-\text{Cl}$
3) $\text{H}-\text{I} > \text{H}-\text{Cl} > \text{H}-\text{Br}$ 4) $\text{H}-\text{Br} > \text{H}-\text{I} > \text{H}-\text{Cl}$

12. Bond energy is least in the following

- 1) $\text{C}-\text{C}$ 2) $\text{N} \equiv \text{N}$ 3) $\text{O}=\text{O}$ 4) $\text{C}=\text{C}$

13. The decreasing order of bond dissociation energies of C-C, C-H and H-H bonds is

- 1) $\text{H}-\text{H} > \text{C}-\text{H} > \text{C}-\text{C}$ 2) $\text{C}-\text{C} > \text{C}-\text{H} > \text{H}-\text{H}$
3) $\text{C}-\text{C} > \text{H}-\text{H} > \text{C}-\text{H}$ 4) $\text{H}-\text{H} > \text{C}-\text{C} > \text{C}-\text{H}$

14. Which of the following has largest bond angle?

- 1) NO_2^+ 2) NO_2 3) NO_2^- 4) NO_3^-

15. Arrange the following in order of decreasing N-O bond length NO_2^+ , NO_2^- , NO_3^-

- 1) $\text{NO}_3^- > \text{NO}_2^+ > \text{NO}_2^-$
2) $\text{NO}_3^- > \text{NO}_2^- > \text{NO}_2^+$
3) $\text{NO}_2^+ > \text{NO}_3^- > \text{NO}_2^-$
4) $\text{NO}_2^- > \text{NO}_3^- > \text{NO}_2^+$

16. The Cl – O bond order in perchlorate ion

- 1) 1 2) 2 3) 1.75 4) 2.5

17. Which of the following is more stable?

- 1) HF 2) HCl 3) HBr 4) HI

18. (A): Dinitrogen is chemically unreactive at ordinary temperature and is very Stable.

(R): The bond dissociation energy is more in N₂ molecule (1).

19. C₂H₅Br + Q₁ C₂H₅[.] + Br[.]



Then relation between Q₁ & Q₂ is

- 1) Q₁ > Q₂ 2) Q₁ < Q₂
3) Q₁ = Q₂ 4) Q₁ + Q₂ = 0

20. In O₂, H₂O₂ and O₃, the correct order of 'oxygen–oxygen' bond length is

- 1) O₂ > O₃ > H₂O₂ 2) O₃ > H₂O₂ > O₂
3) H₂O₂ > O₃ > O₂ 4) O₂ > H₂O₂ > O₃

21. Bond length of H₂ is 0.074nm, Bond length of Cl₂ is 1.98A⁰. Bond length of HCl is

- 1) 2.72A⁰ 2) 136pm 3) 1.027nm 4) 0.136A⁰

22. Energy required to dissociate 4gm of gaseous hydrogen in to free gaseous atoms is 208Kcal at 25°C. The bond energy of H–H would be

- 1) 54 Kcal/mol 2) 104 Kcal/mol 3) 208 Kcal/mol 4) 20.8 Kcal/mol

23. Average C–H bond energy is 416 kJ.mol⁻¹. Which of the following is correct? (2004)

- 1) CH₄ (g) + 416 kJ C (g) + 4H (g) 2) CH₄ (g) C (g) + 4H (g) + 416 kJ
3) CH₄ (g) + 1664 kJ C (g) + 4H (g) 4) CH₄ (g) C (g) + 4H (g) + 1664 kJ

24. The C–H bond distance is shortest in

- 1) C₂H₂ 2) C₂H₄ 3) C₆H₆ 4) C₂H₆

- 25. The bond dissociation of the molecules A₂, B₂, C₂ are 498, 158, 945 KJ/ mole respectively. If so, the correct decreasing order of their bond orders is**

1) A₂, B₂, C₂ 2) C₂, B₂, A₂ 3) C₂, A₂, B₂ 4) B₂, C₂, A₂

- 26. The table shown lists the bond dissociation energies (E_{diss}) for single covalent bonds formed between carbon and atoms of elements A, B, C and D. Which element has the smallest atom?**

Bond between C E_{diss} (KJmole⁻¹)

and other atom

A) C –A 240

B) C – B 328

C) C – C 276

D) C – D 485

1) C

2) D

3) A

4) B

- 27. The correct order of N -O bond length in NO, NO⁻², NO⁻³ and N₂O₄ will be (BHU)**

1) NO > N₂O₄ > NO₂ > NO₃⁻

2) NO > NO⁻³ > N₂O₄ > NO⁻²

3) NO₃⁻ > NO₂⁻ > N₂O₄ > NO

4) N₂O₄ > NO₂⁻ > NO₃⁻ > NO

- 28. The C–H bond distance is largest in**

1) C₂H₂

2) C₂H₄

3) C₆H₆

4) C₂H₄Br₂

- 29. In compounds of type ECl₃, where E =N, P, As or Bi, the angles Cl - E - Cl for different E are in the order**

1) N > P = As = Bi 2) N > P > As > Bi 3) N < P = As = Bi 4) N < P < As < Bi

- 30. The correct order of increasing C-O bond length of CO, CO and CO₂**

1) CO < CO₂ < CO

2) CO₂ < CO < CO

3) CO < CO < CO₂

4) CO < CO₂ < CO

KEY

1) 2 2) 4 3) 4 4) 4 5) 3 6) 3 7) 4 8) 1 9) 1 10) 4

11) 2 12) 4 13) 1 14) 1 15) 2 16) 3 17) 1 18) 1 19) 2 20) 3

21) 2 22) 2 23) 3 24) 1 25) 3 26) 2 27) 3 28) 4 29) 2 30) 4