



STRUCTURE AND BONDING - TUTORIAL 7

BOND LENGTH & OXIDATION NUMBERS

(01) Arrange the following compounds in the increasing order of bond length.

i. N-Cl, N-F, N-Br (N- X bond length)

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ii. SF₂, SF₄, SF₆ (S-F bond length)

.....

iii. O₂, O₂²⁻, O₃ (O - O bond length)

.....

iv. H₂O, H₂S, H₂Se (bond length with H)

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v. NO₂⁻, NO₃⁻, NO⁺, NOF (N-O bond length)

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vi. HBr, HI, HCl, HF (H-X bond length)

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vii. C₂H₆, C₂H₄, C₂H₂ (C - C bond length)

.....

viii. NaCl, MgCl₂, AlCl₃ (M-Cl length)

.....

ix. SO₃, SO₃²⁻, SO₄²⁻ (S-O bond length)

.....

x. CO, CO₂, CO₃²⁻ (C-O bond length)

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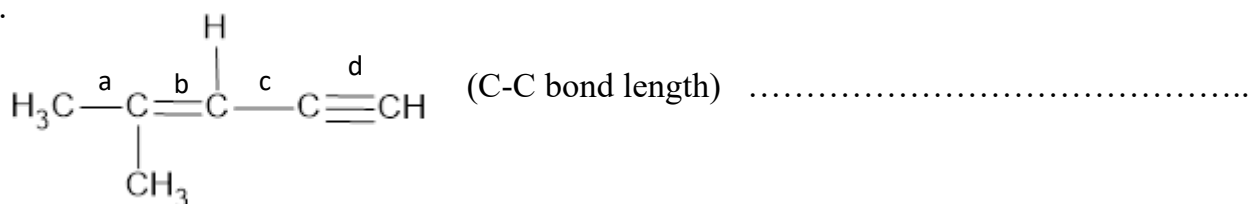
xi. LiCl, NaCl, KCl, CsCl (M-Cl bond length)

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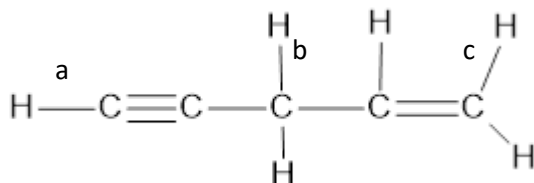
xii. C₆H₆, C₂H₆, C₂H₄ (C-C bond length)

.....

xiii.



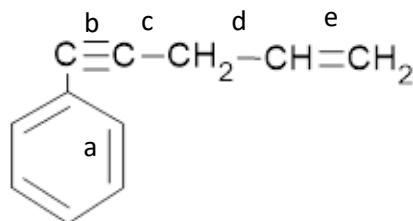
xiv.



(C-H bond length)

.....

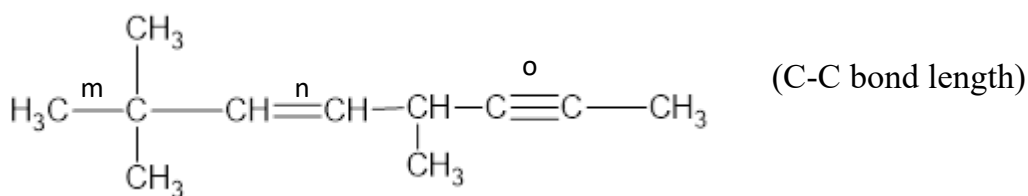
xv.



(C- C bond length)

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xvi.



.....

xvii.



.....

(02). Arrange the following compounds in the increasing order of electronegativity.

i. C, O, N, S, F

ii. H, C, Si, O, S

.....

.....

iii. H, C, O, Cl, F

iv. Na, Mg, Al, Si, P

.....

.....

v. Li, Be, O, Na, Mg

vi. C, H, N, Cl, P

.....

.....

vii. F, Cl, O, S, N

viii. Mg, Li, B, Si, S

.....

.....

(03). Arrange the following compounds in the increasing order of electronegativity of the given atom.

i. NH_4^+ , NH_2^- , NH_3 (N)

ii. CO, CO_2 , CO_3^{2-} (C)

.....

.....

iii. SO_2 , SO_3^{2-} , SO_4^{2-} (S)

iv. O^{2-} , O_2 , O^+ (O)

.....

.....

v. NO_2^- , NO_2^+ , NO_3^- (N)

vi. NO_2F , NH_3 , NO_4^{3-} (N)

.....

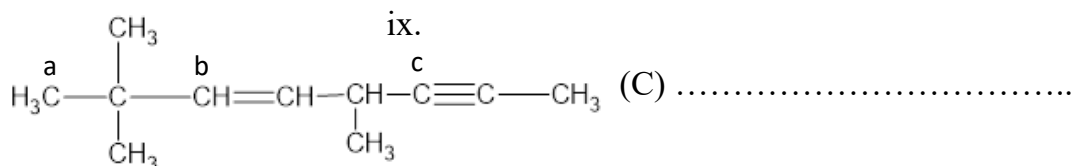
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vii. H_2S , SO_2 , SO_3 (S)

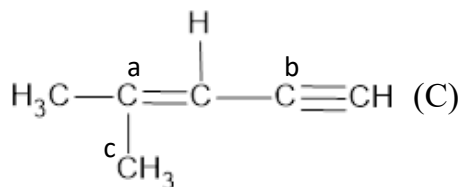
viii. OH^- , H_2O , H_3O^+ (O)

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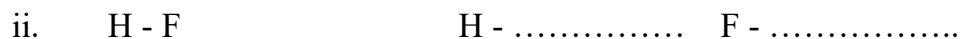


x.

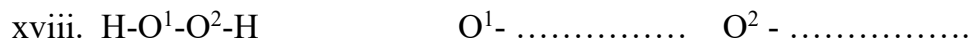
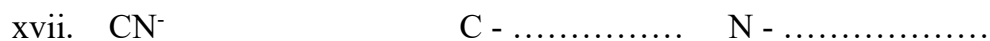
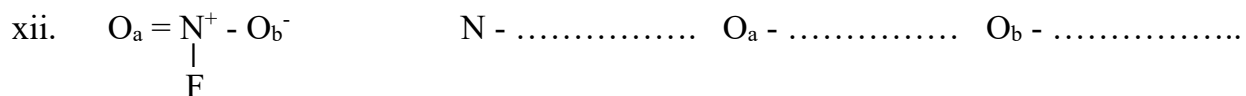
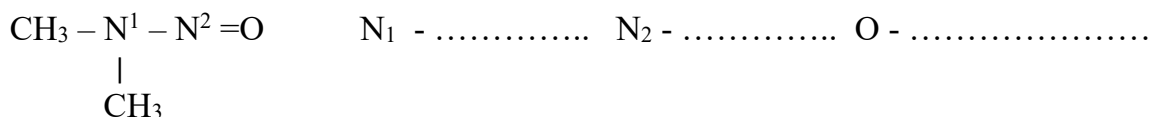


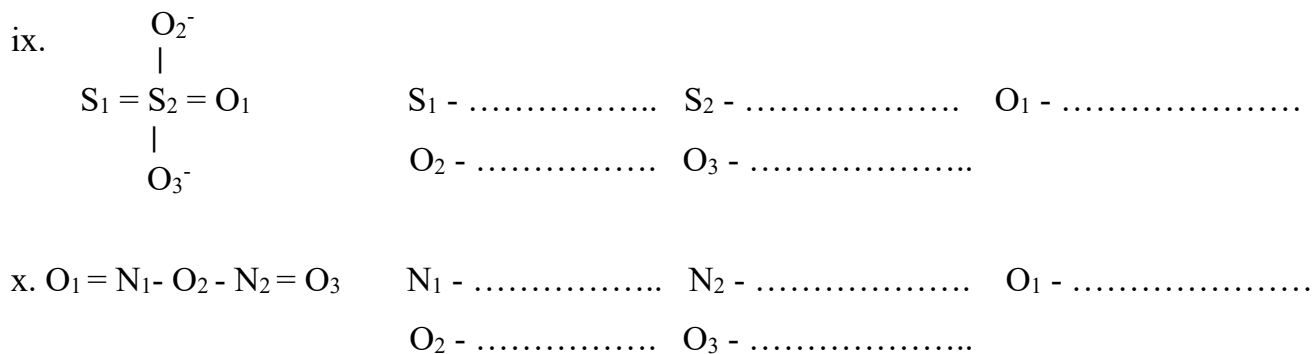
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(04) Find the oxidation numbers of the given atoms.



vii.





(05) Find the oxidation state of the central atoms.

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|---|--|--------------------------------------|--------------------------------------|
| i. SO_2
..... | ii. H_2S
..... | iii. SO_3
..... | iv. H_2SO_4
..... |
| v. H_2SO_3
..... | vi. SO_4^{2-}
..... | vii. S^{2-}
..... | viii. S_8
..... |
| ix. CrO
..... | x. Cr_2O_3
..... | xi. CrO_3
..... | xii. CrO_4^{2-}
..... |
| xiii. $\text{Cr}_2\text{O}_7^{2-}$
..... | xiv. MnO_2
..... | xv. MnO_4^-
..... | xvi. MnO_4^{2-}
..... |
| xvii. Mn_2O_7
..... | xviii. MnO
..... | xix. P_4
..... | xx. H_3PO_4
..... |
| xxi. H_3PO_3
..... | xxii. H_3PO_2^-
..... | xxiii. HClO_4
..... | xxiv. HClO_3
..... |
| xv. HClO_2
..... | xvi. HClO
..... | xvii. Cl_2
..... | xviii. NO_2^-
..... |
| xxix. NO_3^-
..... | xxx. NH_4^+
..... | xv. Mn_2O_7
..... | xvi. POCl_3
..... |
| xvii. Cl_2O_7
..... | xviii. N_2O_3
..... | | |