

VIDYAPEETH



BATCH CODE: 19-PJ301EA 2025

SUBJECT NAME: CHEMISTRY

CHAPTER NAME:

Chemical bonding and molecular structure

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Lecture No.

07

By – Swapnil Sir



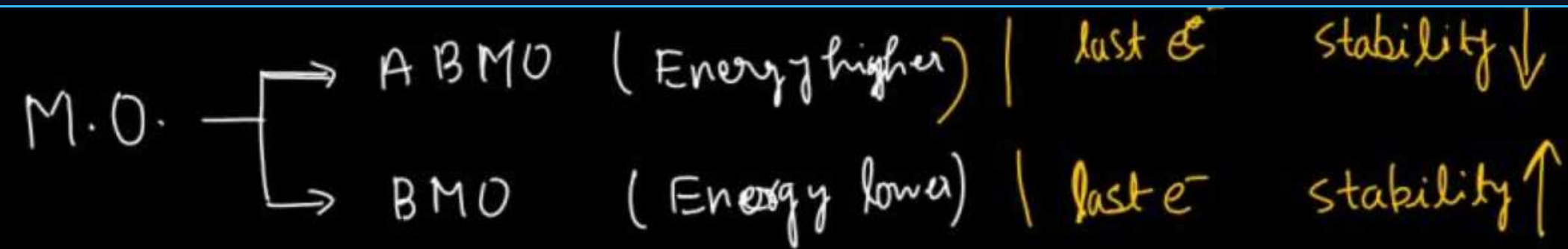
Today's Goal

Subtopic

- Molecular Orbital Theory
- Molecular Interactions
- special Bonding
3c-2e Bonds

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homodiatomic molecule

$$Z \leq 7$$

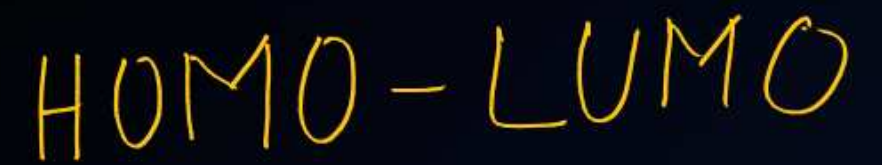
$$Z \geq 8$$

as per carbon

heterodiatomic molecule







Highest Occupied molecular orbital

Lowest Unoccupied molecular orbital

$$\boxed{\overline{F}_2} = 18$$

Special Bonding ð¸

H-Bonding

Hydrogen bonding

Hydrogen Bonding

Intermolecular H-Bonding

Intramolecular H-Bonding

F
O
u-SN

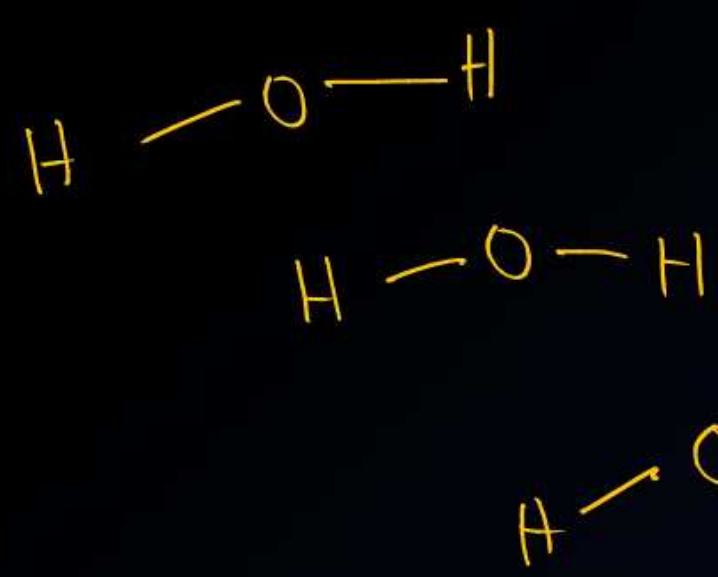
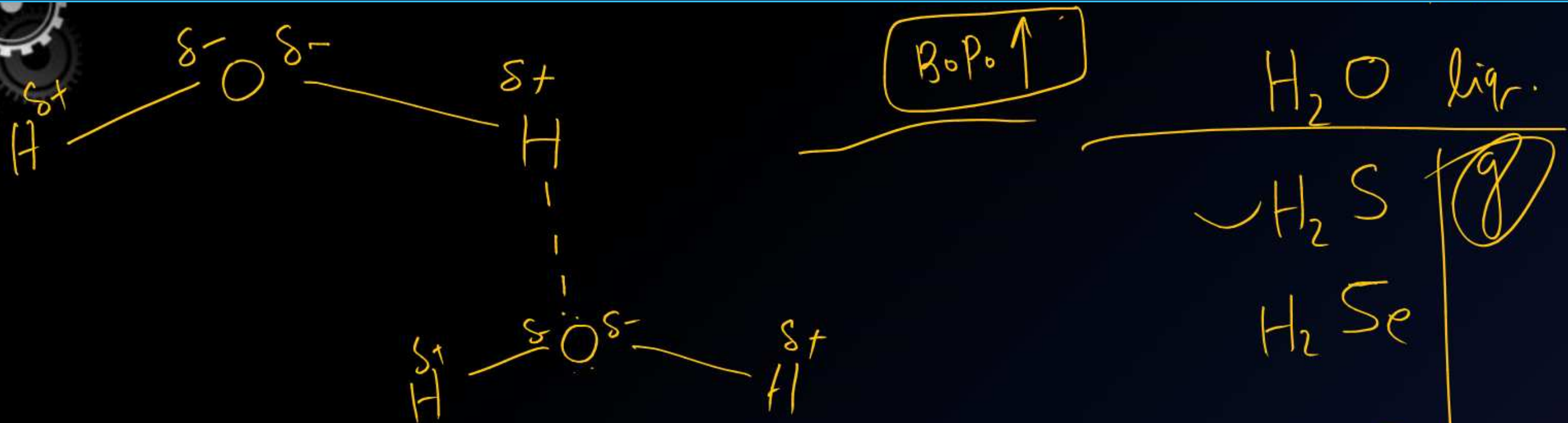
H

$\delta^+ \quad \delta^-$
H — F

$\delta^- \quad \delta^+$
H — F — — — H — F

dipole moment
= $q \times l$

formation of a dipole

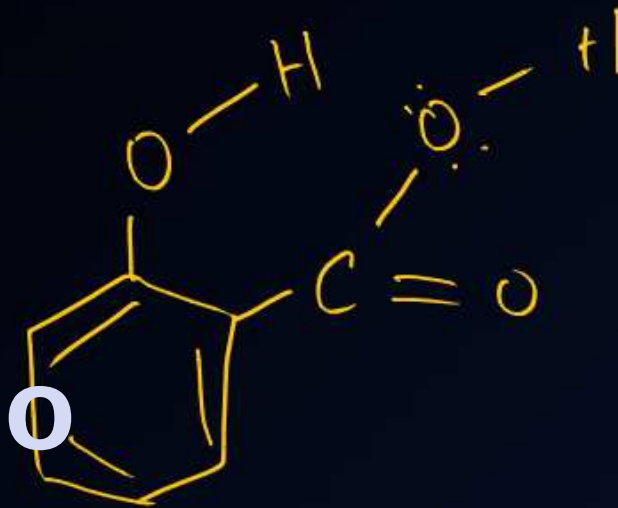


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factors affecting strength of H-bond

→ ① Partial +ve charge on H-atom

→ ② Polarisability of EN atom



Intro

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Molecular Interactions

Ion - ion

Ion - dipole

dipole - dipole

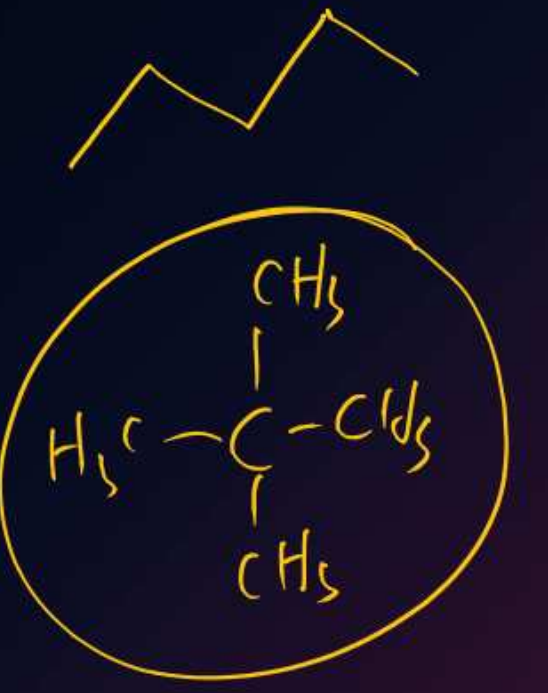
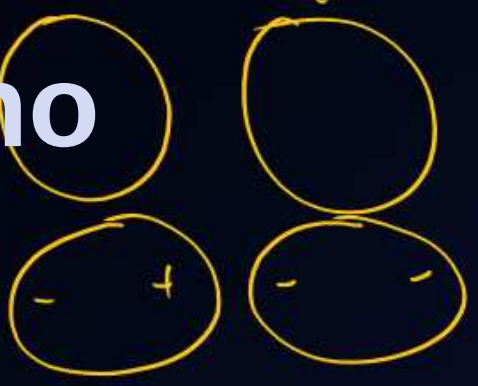
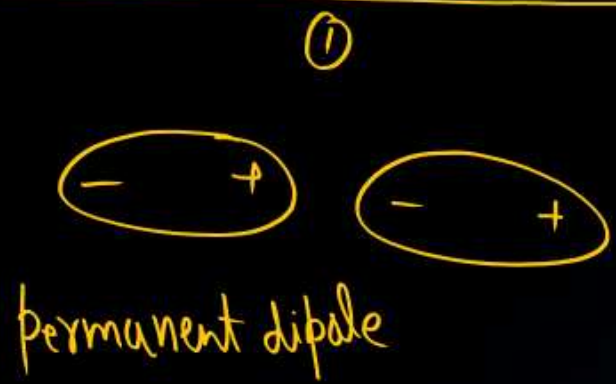
H bonding

Van-der-Wall interaction

dipole - dipole

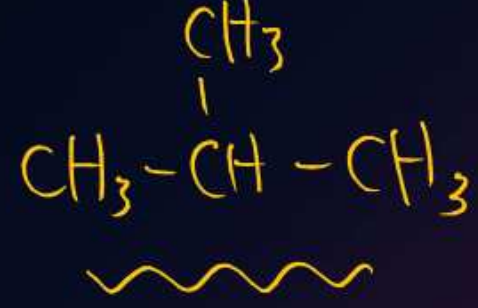
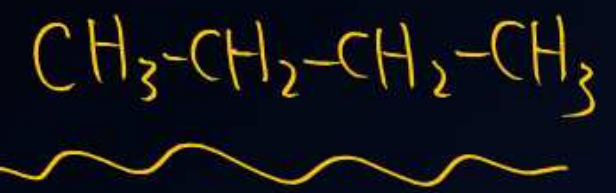
dipole - induced dipole

Dispersion force
{ London forces }



Factors →

①



Energy - distance Relationship



① Ionic Bond $\frac{1}{r}$

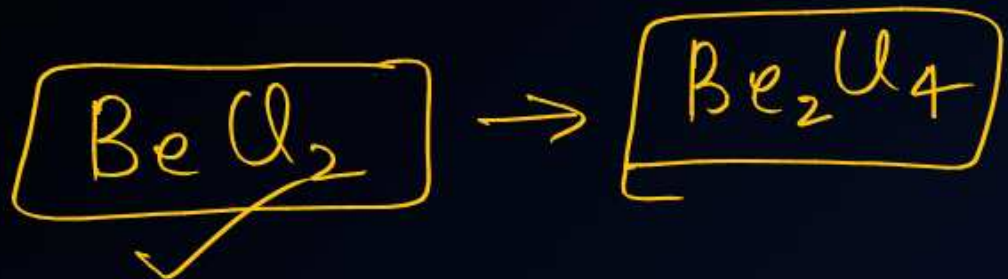
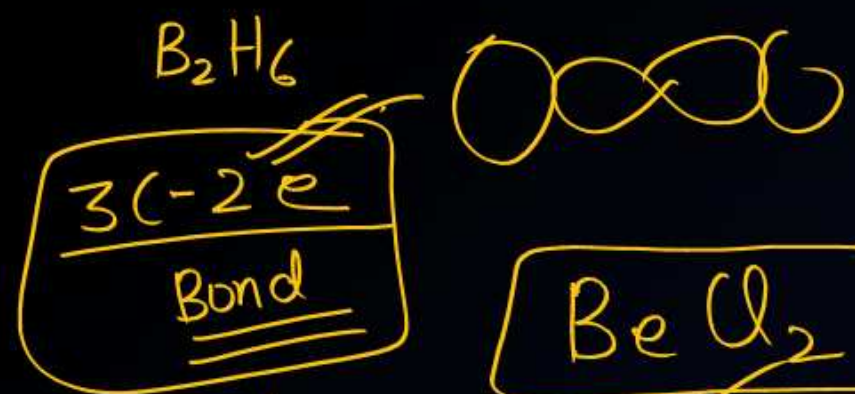
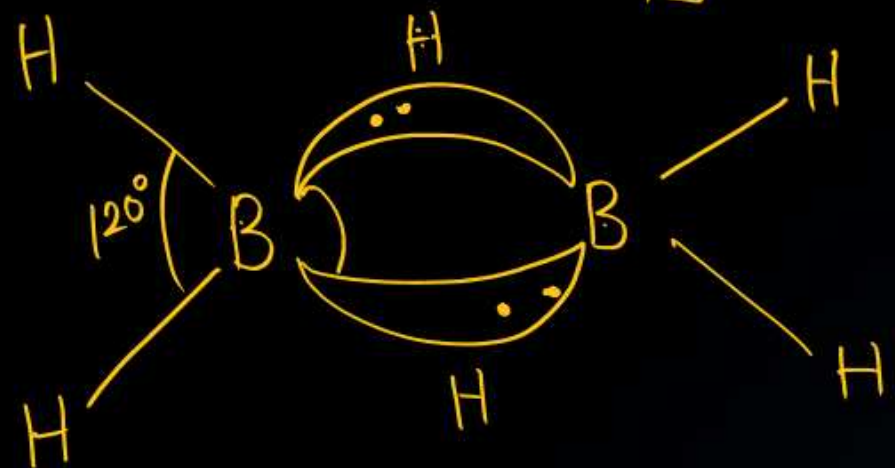
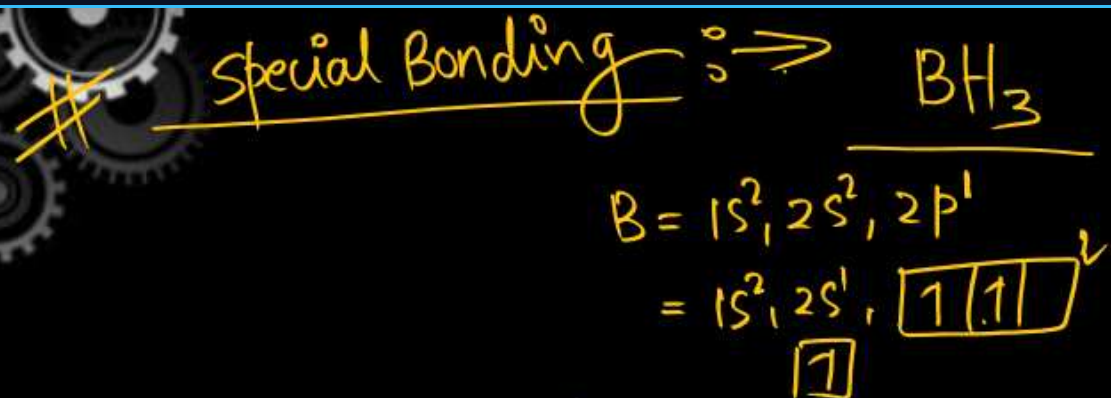
② Ion-dipole $\frac{1}{r^2}$

③ dipole-dipole $\frac{1}{r^3}$

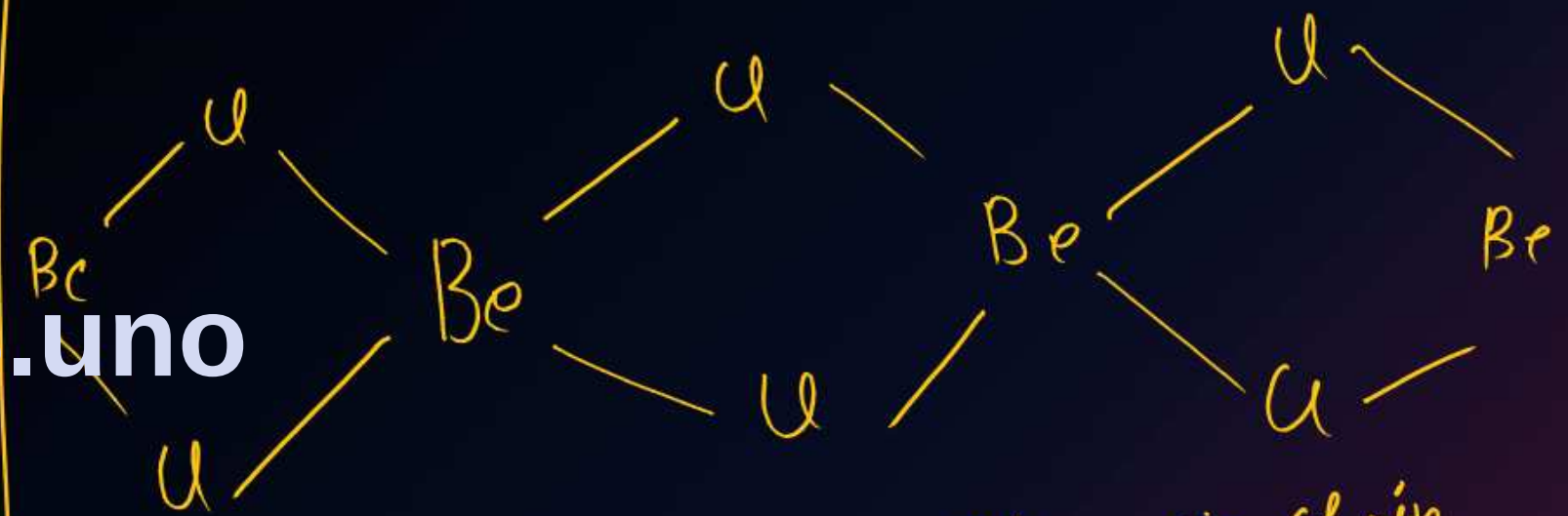
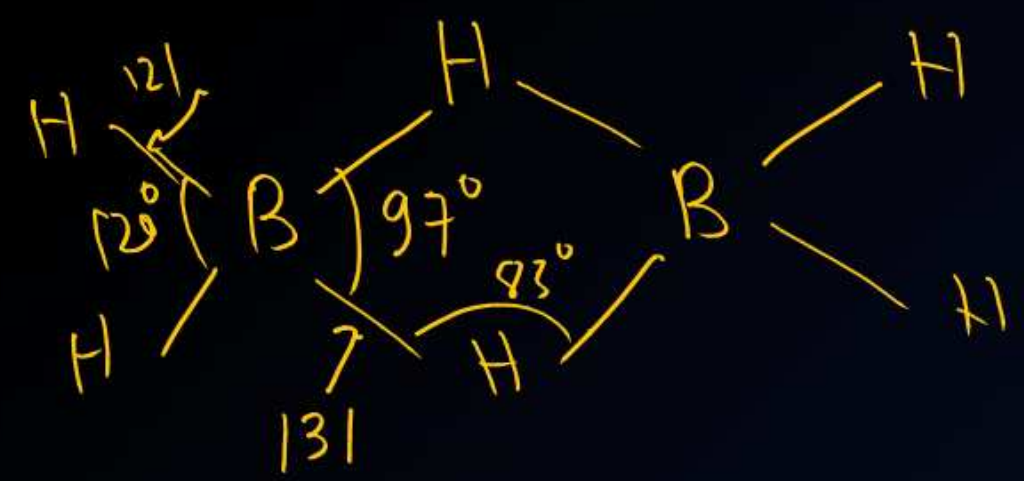
④ Ion-induced dipole $\frac{1}{r^4}$

⑤ dipole-induced dipole $\frac{1}{r^6}$

⑥ London dispersion $\frac{1}{r^6}$



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3(-4e)
bond

Polymeric chain $\Rightarrow$



$$\sigma_{1s}^2$$
$$\sigma_{1s}^{*2}$$
$$\sigma_{2s}^2$$
$$\sigma_{2s}^{*2}$$

$$\pi_{2p_x}^2$$
$$\pi_{2p_y}^2$$

$$\sigma_{2p_z}^2$$
$$\pi_{2p_x}^{*2}$$
$$\pi_{2p_y}^{*2}$$
$$\sigma_{2p_z}^{*2}$$

O₂

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HOMO = σ_{2p_z}

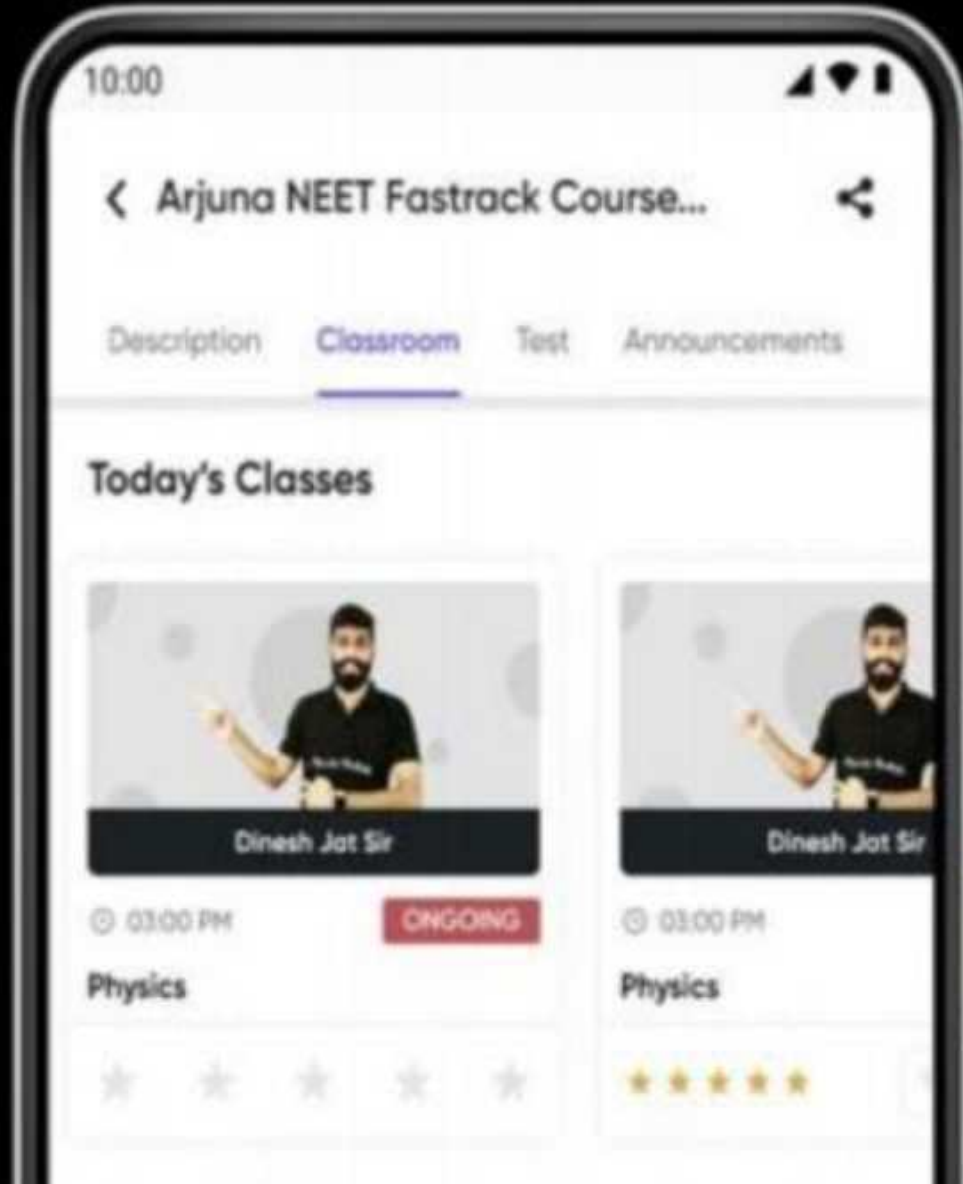
LUMO = $\pi_{2p_x}^*$
or $\pi_{2p_y}^*$



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Solve the DPP and check Solution



"SCAN" to join our "TELEGRAM" channel

**VIDYAPEETH**Scan for Solution

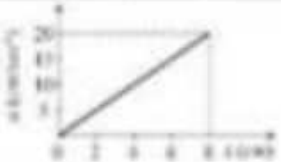
WORK, POWER AND ENERGY

DPP-1 (JAP/046)

[Introduction, Definition of work, work done by constant force, Area under force-displacement curve]

1. A particle moves from position $\vec{r}_i = 3\hat{i} + 2\hat{j} - 6\hat{k}$ to position $\vec{r}_f = 14\hat{i} + 13\hat{j} + 9\hat{k}$ under the action of force $-4\hat{i} + \hat{j} + 3\hat{k}$ N. The work done by this force will be

(A) 100 J
(B) 50 J



(A) 8×10^{-2} joules
(B) 16×10^{-2} joules
(C) 4×10^{-2} joules

Thank You!!!!

Check your performance through Student Dashboard



#	VBT Hydr VSEPR	MOT	Intermction	speial Bond
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