

Dr. Ambedkar College Deekshabhoomi, Nagpur
Department of Chemistry
Students' Seminar for B.Sc. Sem I & B.Sc. Sem III - 2020

Chemistry seminars are organized for B.Sc. Sem I students online on dated 30/12/2020. Seminars were conducted on different topics. We have conducted online seminars. The students explained very well their interesting topics by using power point methods. B.Sc. Sem I students almost covered the topics of all the 4 units. The topics are - Idea of De Broglie Matter Waves, Noble Gases and its real life application, Heisenberg Uncertainty Principle, Noble Gases, Quantum Numbers, Hydrogen Bonding, Ionization Potential and Compounds in Noble Gases etc.

The following students participated in the seminar:

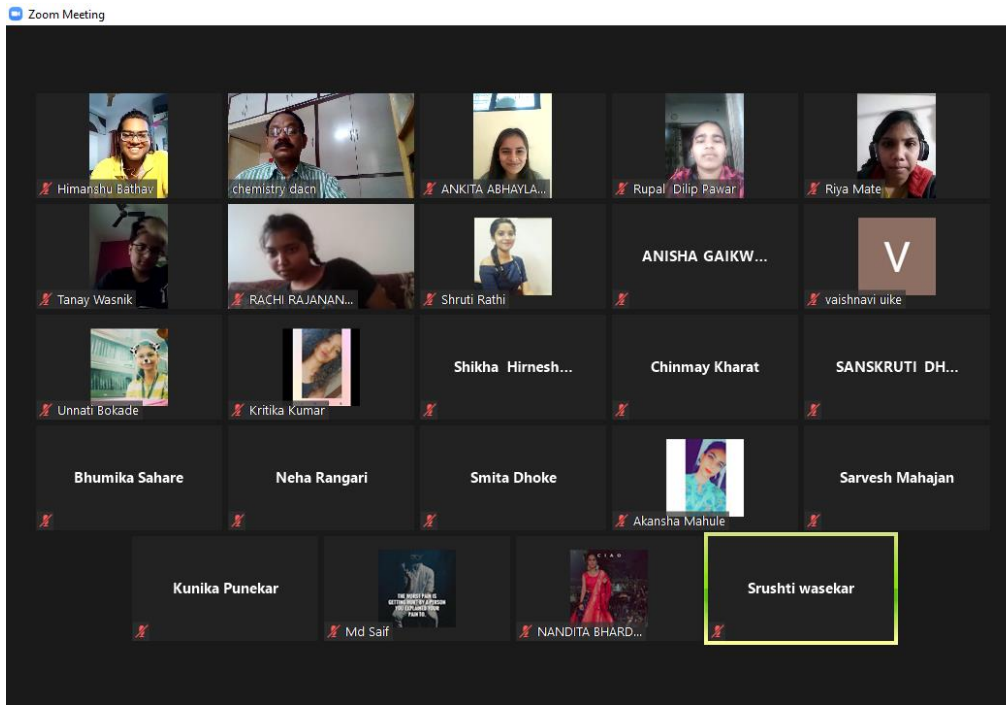
- | | |
|----------------------|--|
| 1. Riya Gadghate | Idea of de Broglie matter waves |
| 2. Dhanashree Kakad | Noble Gases and its real life applications |
| 3. Akshat Hatwar | Heisenberg Uncertainty Principle |
| 4. Tanushree Chauhan | Noble Gases |
| 5. Deepti Ramteke | Quantum numbers |
| 6. Manasi Parihar | Hydrogen Bonding |
| 7. Saheli Chakre | Ionization Potential |
| 8. Rashmi Rawate | Compounds in Noble Gases |
| 9. Rachi Rajan | Separation of lanthanides |
| 10. Shruti Rathi | Ion Exchange Method |

The students explained very well their topics along with diagrams and necessary equations. They used PowerPoint methods and the seminar was conducted online.

V. M. Shivankar, Professor of the Chemistry Department conducted online seminars for the B.Sc. Sem I students.

Dr. V. M. Shivankar
Professor
Department of chemistry
Dr. Ambedkar College Deekshabhoomi Nagpur

B.Sc. Sem I - 2020



Treatment for Homonuclear Diatomic Molecules

Energy level diagram for H₂ showing the combination of two 1s atomic orbitals into bonding and antibonding molecular orbitals.

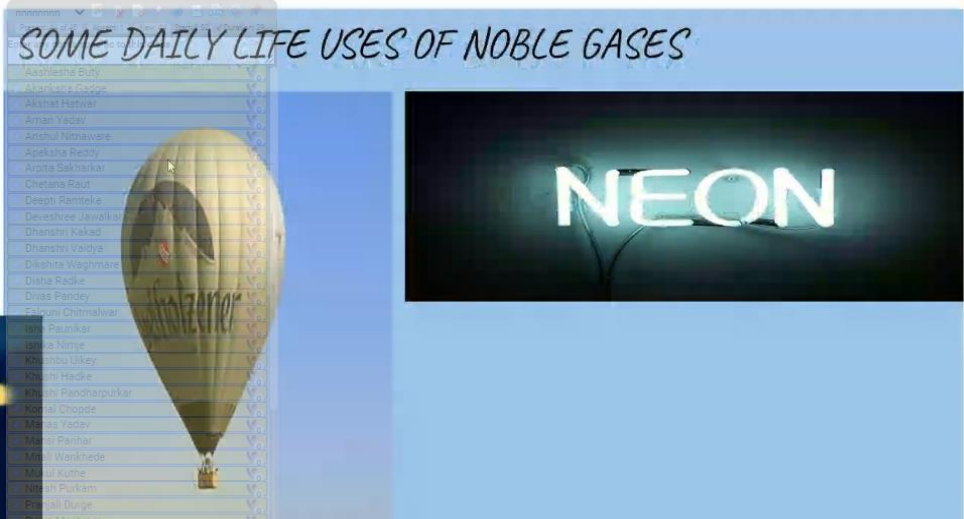
Molecular Orbital Treatment for Homonuclear Diatomic Molecules

(1) Hydrogen molecule, H₂: Hydrogen molecule is formed from two atomic orbitals of two atoms. They give rise to two molecular orbitals σ(1s) and σ*(1s). Both these electrons will be in σ(1s) bonding molecular orbital, but with opposite spins. The antibonding molecular orbital remains vacant. The electronic configuration of the molecule is σ(1s)²σ*(1s)⁰.

$$\text{Bond order} = \frac{1}{2} (N_b - N_a) = \frac{2 - 0}{2} = 1.0$$

Since its B.O. is 1.0, so it exists and is stable.

SOME DAILY LIFE USES OF NOBLE GASES



A hot air balloon is shown on the left side of the slide, and a glowing neon sign with the word 'NEON' is on the right side. The background is a light blue gradient.

3. VISCOSITY

- > It is the resistance to the flow of liquid.
- > If more hydrogen bonding more will be the viscosity.
- For example : If we compare ethanol , glycol and glycerol

$$\begin{array}{c} \text{OH} \\ | \\ \text{H}_3\text{C}-\text{CH}_2 \end{array}$$

Ethanol

$$\begin{array}{c} \text{HO} \quad \text{OH} \\ | \quad | \\ \text{H}_2\text{C}-\text{CH}_2 \end{array}$$

Ethylene glycol

$$\begin{array}{c} \text{HO} \quad \text{OH} \quad \text{OH} \\ | \quad | \quad | \\ \text{H}_2\text{C}-\text{CH}-\text{CH}_2 \end{array}$$

Glycerin

- > We can see that in ethanol one OH group is present , in glycol two OH group is present and in glycerol three OH group is present therefore glycerol having more no. of hydrogen bonds so it is more viscous than glycol and ethanol.
- > Order of viscosity is :
Glycerol > glycol > ethanol

10:42

IONIZATION POTENTIAL CHEM - Read-only

Read Only - You can't save changes to L...

IONIZATION POTENTIAL

IONIZATION POTENTIAL(IP) OR IONIZATION ENERGY IS MINIMUM ENERGY REQUIRED TO REMOVE OUTER MOST ELECTRON FROM ISOLATED GAS ATOM IN ITS GROUND STATE.

THE ENERGY REQUIRED TO REMOVE 1ST ELECTRON IS CALLED 1ST IP AND ENERGY REQUIRED TO REMOVE 2ND ELECTRON IS CALLED 2ND IP AND SO ON.

•SECOND IONIZATION ENERGY is required to remove the second electron from the gaseous atom, and so forth.

•The SECOND IONIZATION ENERGY is always HIGHER than the FIRST IONIZATION ENERGY, since the electron that is removed is from an inner energy level which has stronger electrostatic force with the nucleus.

FACTORS AFFECTING IP

10:42

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FACTORS AFFECTING IP

As the host, you can remove anyone at any time Deny entry Admit

TOPIC : HYDROGEN BONDING

BY: MANSI M PARIHAR
(FROM BTBC GROUP SEM -1)

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1. INTERMOLECULAR HYDROGEN BONDING

➤ Definition : It is the type of hydrogen bonding in which the hydrogen bond is formed between two or more molecules .

- For example : Water molecule (H_2O) Alcohol molecule (R-OH)

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Dhanshri Kakad is presenting

Enter any notes specific to this class.

NOBEL GASES.

Enter any notes specific to this class.

What do Party Ballons, Neon Signs, and certain Lightbulb have in common in them...????

They are all filled with a Noble Gases.

Enter any notes specific to this class.

$$\Delta x \Delta p \geq \frac{h}{4\pi}$$

THE UNCERTAINTY PRINCIPLE

Δx = Uncertainty in position
 Δp = Uncertainty in momentum


It is not possible to measure simultaneously both the position and momentum of a small moving particle with absolute accuracy or certainty.

B.Sc.sem. III-2020

jzt-jphg-skn - Nov 3, 2020

2) **Separation of Lanthanides:-**
In this column is packed with cation exchange resin of type R-H. When solution containing mixture of lanthanides is poured on the top of the hen following equilibrium takes place,
$$3R-H + Ln^{3+} \rightleftharpoons R_3 \text{ } Ln^{3+} + 3H^+$$

In case of lanthanides the ionic radii of tripositive ions decreases with increase in atomic number i.e. from lanthanum to lutecium. Hydration of ion increases with decrease in ionic size and therefore hydrated size of lanthnone ion increases with increase in atomic number. Lanthnone ion having small hydrated size(La) will strongly adsorb on the resin and vise versa (Lu). Hence lanthnone ion held by resin decreases from La to Lu. When HCL solution is passed as mobile phase separation of lanthanides takes place in reverse order of atomic number. Lutecium ion will separate out first where as Lanthanum ion separate at last. For better separation elution is carried out using ammonium Citrate buffer at pH 2.8 -3.4.

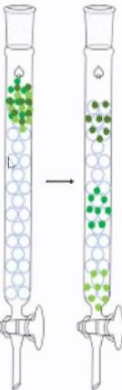


chemistry dacr
Shruti Rathi
ANKITA ABHAYLAL P...
RACHI RAJANA...

jzt-jphg-skn - Nov 3, 2020

ION EXCHANGE METHOD

THE REVERSIBLE EXCHANGE OF LIKE IONS BETWEEN STATIONARY SOLID PHASE AND MOBILE LIQUID PHASE IS CALLED ION EXCHANGE. This technique involves two phases, the stationary phase is ion exchange resins. THE RESINS IS CROSS-LINKED ORGANIC POLYMERS HAVING -COOH, -SO₃H, -OH, etc groups as functional group. They can exchange H⁺ ions with the cation present in the mobile liquid. This resins filled in the column and mobile liquid containing cations is allowed to flow through the column. During motion, exchange of ion takes place between the two phases. Movement of mobile phase is called ELUTION while the mobile phase is called as ELUENT. Separation of ions can be achieved on the basis of difference in the relative strength of resin-ion bond.



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RACHI RAJANA...