34.1 Lewis Structures

Chemistry

Summarize main points from each video.

Video Title / topic _____

Video Title / topic _____

Video Title / topic _____

Topic Introduction

Summarize your understanding of each paragraph.

Lewis structures are diagrams that show the bonding between atoms of a molecule and the lone pairs of electrons that may exist in the molecule. Lewis structures show each atom and its position in the structure of the molecule using its chemical symbol.

Lines are drawn between atoms that are bonded to one another (pairs of dots can be used instead of lines). Excess electrons that form lone pairs are represented as pairs of dots, and are placed next to the atoms

The total number of electrons represented in a Lewis structure is equal to the sum of the numbers of valence electrons on each individual atom. Non-valence electrons are not represented in Lewis structures.

When the Lewis structure of an ion is written, the entire structure is placed in brackets, and the charge is written as a superscript on the upper right, outside the brackets.

Read/Summarize Text

1. **Read the passage.**
2. **Underline key expressions in each sentence.**
3. **Re-write each word (or expression) you underlined.**
4. **Summarize the passage.**

Resonance Structures.

1

2

For some molecules and ions, it is difficult to determine which lone pairs should be moved to form double or triple bonds, and two or more different resonance structures may be written for the same molecule or ion. In such cases it is usual to write all of them with two-way arrows in between. This is sometimes the case when multiple atoms of the same type surround the central atom. When this situation occurs, the molecule's Lewis structure is said to be a resonance structure, and the molecule exists as a resonance hybrid. Each of the different possibilities is superimposed on the others, and the molecule is considered to have a Lewis structure equivalent to some combination of these states.

https://en.wikipedia.org/wiki/Lewis_structure

Re-write words you underlined

3

_____ _____ _____

_____ _____ _____

Using a complete sentence, summarize or rephrase the passage

4

Read Text for Comprehension

Read this article for deeper understanding. No summary is required, although you may want to circle, underline, or mark key ideas and words.

Valence electron

In chemistry, a valence electron is an outer shell electron that is associated with an atom, and that can participate in the formation of a chemical bond if the outer shell is not closed; in a single covalent bond, both atoms in the bond contribute one valence electron in order to form a shared pair. The presence of valence electrons can determine the element's chemical properties, such as its valence—whether it may bond with other elements and, if so, how readily and with how many. For a main group element, a valence electron can exist only in the outermost electron shell; in a transition metal, a valence electron can also be in an inner shell.

An atom with a closed shell of valence electrons (corresponding to an electron configuration s2p6) tends to be chemically inert. Atoms with one or two more valence electrons than are needed for a "closed" shell are highly reactive due to the following reasons:

> *1) It requires relatively low energy (compared to the lattice enthalpy) to remove the extra valence electrons to form a positive ion.*
>
> *2) Because of their tendency either to gain the missing valence electrons (thereby forming a negative ion), or to share valence electrons (thereby forming a covalent bond).*

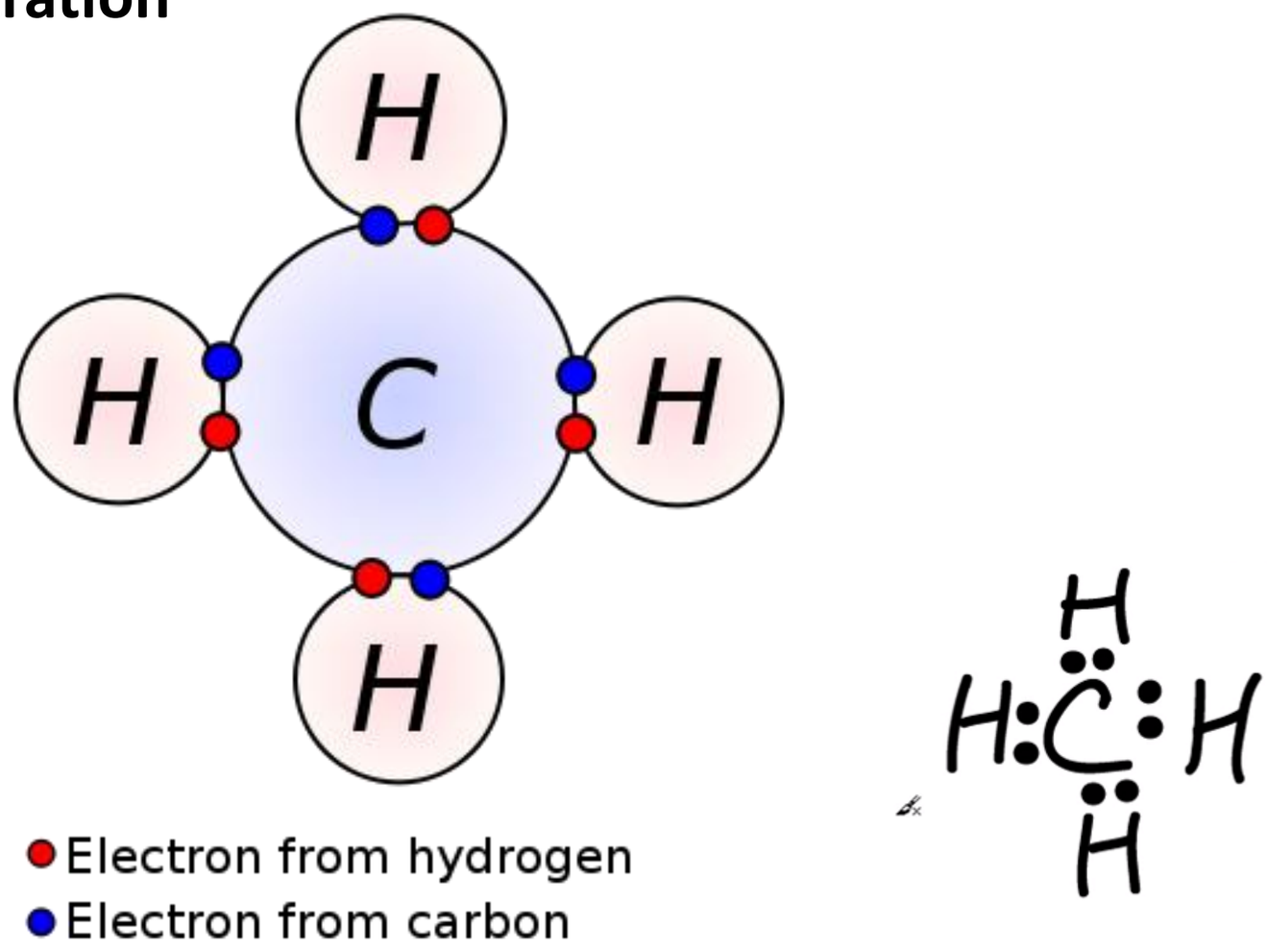
Similar to an electron in an inner shell, a valence electron has the ability to absorb or release energy in the form of a photon. An energy gain can trigger an electron to move (jump) to an outer shell; this is known as atomic excitation. Or the electron can even break free from its associated atom's valence shell; this is ionization to form a positive ion. When an electron loses energy (thereby causing a photon to be emitted), then it can move to an inner shell which is not fully occupied.

https://en.wikipedia.org/wiki/Valence_electron

Draw Illustration

Copy and Label the Illustration in the Space Provided

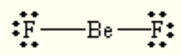
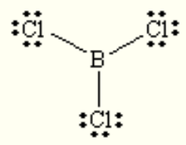
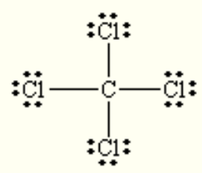
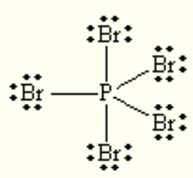
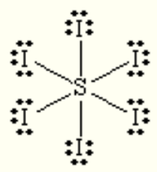
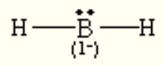
Methane Illustration

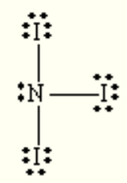
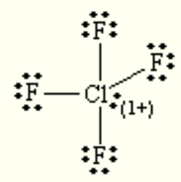
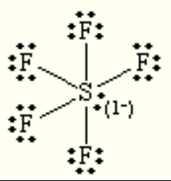


https://en.wikipedia.org/wiki/Valence_electron#/media/File:Covalent.svg

Draw (Copy) the Illustration Here

Practice These

BeF_2	
BCl_3	
CCl_4	
PBr_5	
SI_6	
BH_2^-	

NI_3	
ClF_4^+	
SF_5^-	

http://www.chem.purdue.edu/vsepr/prelab_answers.html

Show-Off Your Smarts!

Instructions

- Complete as an individual or small group.
- Discuss your ideas/answers/responses in a small group.
- Select one person to present your responses to the class.

Q1. How can this information be applied to a young-person's life?

Q2. How does this information apply to (or impact) communities?

Q3. When do scientists need to apply this information? How?

Q4. How would a person from 100 years ago view this information?

Q5. How does this topic connect to other science topics or math?

Write down at least three words introduced or covered by this topic.

1.
2.
3.
4.
5.
6.

Make a Poster

In the space provided here, create/draw a poster which conveys the concepts you have learned on this topic.