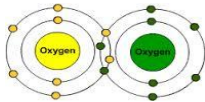


Pre-Content/Content Post Content	Learning Outcomes/ Objectives	
	General	Specific
<u>Pre Content</u> Importance of the element carbon	Students will be able to: <u>appreciate</u> the importance of carbon. <u>recall</u> the atomic no, symbol and electronic configuration of carbon	Students will be able to: <u>identify</u> various things around them which are made of the versatile element carbon. <u>realize</u> the importance of carbon and its compound.
<u>Content</u>		
<u>Covalent Bond</u>	<u>define</u> and draw covalent bond. <u>differentiate</u> between ionic and covalent bond.	<u>correlate</u> the bonds formed as single, double or triple to the number of pairs of electrons shared between atoms. <u>reason</u> why covalent and not ionic bond is formed in carbon atom. <u>list</u> three types of covalent bonds. <u>connect</u> the electron dot structure of atoms for the formation of covalent bonds
<u>Homologous Series</u>	<u>learn</u> the nomenclature of compounds	<u>apply</u> general formula of homologous series. <u>identify</u> the name of homologous series <u>select</u> the compound and identify the functional group.
<u>Functional Groups</u>	<u>draw</u> the structural formula of the functional group	
<u>Nomenclature of Carbon Compounds</u>	<u>list</u> the rules of writing IUPAC names of various carbon compounds. <u>identify</u> the functional group associated with each of them. <u>list</u> their properties	<u>predict</u> the IUPAC names of various carbon compounds <u>construct</u> the structural formula of various carbon compounds
<u>Chemical properties of Carbon Compounds</u>	<u>classify</u> the reactions as oxidation, addition and substitution reactions	<u>analyze</u> the chemical equations and <u>list</u> the necessary conditions for the reactions
<u>Combustion</u>	<u>define</u> Combustion	<u>distinguish</u> between Incomplete and complete combustion.
<u>Oxidation</u>	<u>relate</u> oxidation to daily life.	<u>appreciate</u> the use of addition reaction in hydrogenation of oil.
<u>Addition</u>	<u>differentiate</u> between hydrogenation and halogenation reactions.	<u>appreciate</u> the importance of hydrogenation and halogenation reactions.
<u>Substitution</u>	<u>analyze</u> the various steps involved in substitution reaction	<u>propose</u> the various steps involved in the substitution reaction.
<u>Properties of Ethanol and Acetic acid</u>	<u>appreciate</u> the application and uses of both acetic acid and ethanol in daily life. <u>judge</u> the harmful effects of ethanol and methanol. <u>define</u> saponification	<u>compare</u> the physical and chemical properties of ethanol and acetic acid
<u>Soaps and detergents</u>	<u>list</u> the steps of cleansing mechanism	<u>predict</u> the formula of soap and detergents <u>differentiate</u> hard water from soft water
<u>Post Content:</u> Recapitulate the important terms, rules of nomenclature and chemical reactions. The element carbon is of immense significance to us in both the elemental and combined form.	<u>appreciate</u> the importance of carbon as an element in our daily lives.	<u>compare and contrast</u> the properties of various carbon compounds

- **Home work/ Assignments:** Question and Answers from NCERT textbook and worksheets.

Teacher's Activity	Student's Activity	Teacher's Observation and Remedial action taken
Teacher will- <u>discuss</u> the importance of carbon in daily life, how to test the presence of carbon in a compound. <u>correlate</u> the electronic configuration and atomic number of carbon. <u>use Ball and Stick model</u> to show valency of carbon and structure of methane. (Integration of Art)  <u>explain</u> the concept of homologous series and functional groups with the help of a video: <u>list</u> the rules of writing IUPAC names of carbon compounds with the help of video: <u>differentiate</u> between complete and incomplete combustion with the help of a video Annexure 4 A make necessary arrangements of the material required for the activity and give step wise instructions for the activity. (Integration of Art) <u>explain</u> the chemical properties of ethanol and acetic acid using a video Annexure 4 B <u>guide</u> the students to test the sample of tap water and distilled water for hardness and softness. discuss NCERT back exercise and exemplar questions	Students will- <u>compile</u> a list of various substances made of carbon used in daily life and <u>identify</u> what are these made up of, whether they contain carbon. <u>draw</u> the covalent bond of carbon and hydrogen in their notebooks <u>draw</u> the electron dot structures of various elements and compounds like O₂, N₂, H₂O, NH₃, CH₄  <u>practice</u> questions based on homologous series to classify homologous series apply the general formula, identify and name the series, identify the functional group. <u>predict</u> writing IUPAC names of carbon compounds. <u>observe</u> carefully and solve related questions Annexure 4 a <u>illustrate</u> the chemical reactions by <u>creating</u> ball and stick models using blue and red binds and solve problem related questions. <u>observe</u> carefully and solve related questions Annexure 4 b <u>analyze</u> the sample of hard water and soft water by putting soap solution in both the samples and judge each sample by lather formation. <u>apply</u> the concepts learnt and <u>solve</u> the questions	

Teaching Aids: Ball and stick model, samples of Carbon compounds, activities performed in the laboratory, activity kits, activity worksheet, ICR, Internet, Reference books and text books.

Methodology/ Innovative Methods: Students understand covalent bond by preparing ball and stick models of hydrocarbons.

Interdisciplinary Links: **History:** Carbon dating for identifying the age of fossils. **Environment:** Carbon dioxide formed during burning of carbon and its compounds leads to air pollution and global warming.

ANNEXURE 4A, 4a

CONVERSION OF UNSATURATED COMPOUNDS TO SATURATED COMPOUNDS

Subject	Science
Class	X
Chapter/Unit	Carbon and its Compounds
Topic	Hydrogenation of Ethyne to Ethane
Time	45 minutes
Nature of Activity	Individual

What will I learn (Learning Outcome)?

To differentiate between saturated and unsaturated compounds and understand conversion of Ethyne to Ethane through Hydrogenation reaction.

Skills:

Analyzing and Creating

What I have to do?

To depict the Hydrogenation reaction by constructing a ball and stick structural model of Ethyne and converting it into Ethane

What do I require?

White rectangular cut out of size 15X10 cm (approximately), red bindis/small red colour circles (to depict carbon atoms), blue bindis/blue colour circles (to depict hydrogen atoms) and match sticks (with coated end removed) or toothpicks (with sharp end removed) and a pen.

What do I need to know?

Carbon is a tetravalent atom. Each carbon atom has the capacity to form bonds with 4 other monovalent atoms. Therefore, Carbon has the unique ability to form bonds with other atoms of carbon to form long chain, branched chain and ring compounds. This property of carbon is termed as catenation. Carbon atoms may link with each other by a single bond, double bond or a

triple bond. Compounds with a double or a triple bonds between two carbon atoms are called as **unsaturated carbon compounds** and the compounds with a single bond between two carbon atoms are called as **saturated carbon compounds**.

➤ Teacher's Activity

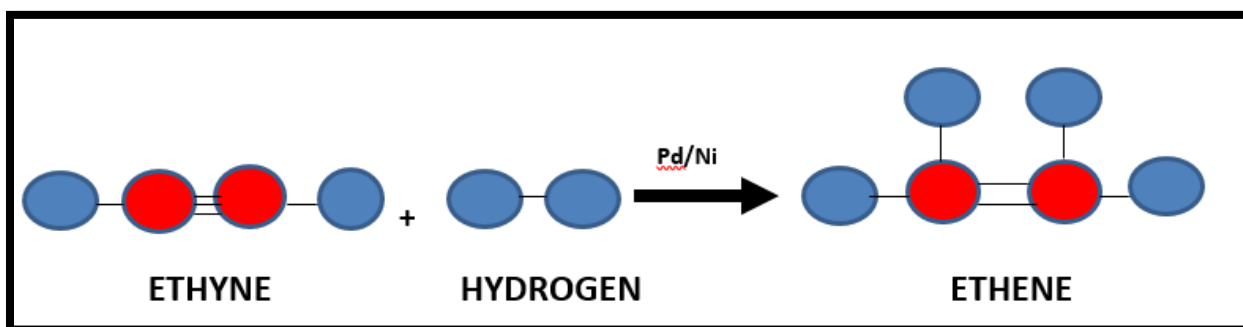
Teacher will:

1. recapitulate the previous knowledge of the students.
2. brief the use of red bindis as Carbon atoms, blue bindis as Hydrogen atoms and match sticks for making the bonds.
3. make necessary arrangements for the material required for the activity and give step wise instructions for the activity

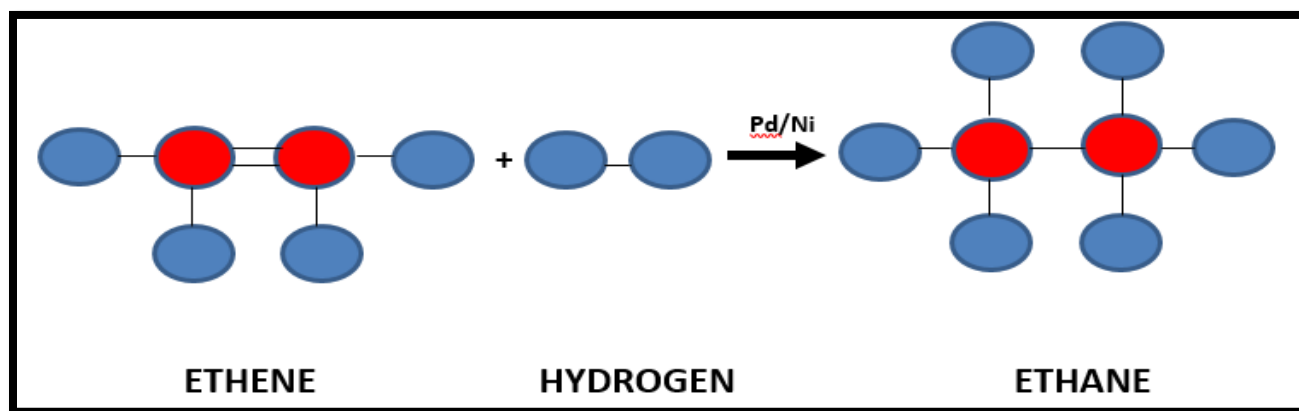
How will I proceed?

➤ Student's Activity

1. Take a rectangular cut out and paste two red bindis adjacent to each other at an approximate distance of 2-3cm.
2. Place three match sticks between the two red bindis to depict a triple bond.
3. Paste one blue bindi on the either side of each red bindi to depict a hydrogen atom. Complete the bond formation between the red and blue bindi by a placing one match stick between them.
4. Similarly, construct molecular model of Hydrogen, using two blue bindis and two matchsticks between them, adjacent to the Ethyne molecule formed in the above step.
5. Put a plus sign between them using a pen. Make a forward arrow using a toothpick.



- Complete the above reaction depicting Hydrogenation of Ethyne to Ethene by making a similar structure for Ethene molecule using red and blue bindis.
- Now, construct another molecule of Hydrogen adjacent to Ethenelike in step-4.
- Complete the above reaction depicting Hydrogenation of Ethene to Ethane by making a similar structure for Ethane molecule using red and blue bindis.



What have I observed?

S. No.	Name of the compound	Number of bonds between Carbon-Carbon	Number of bonds between Carbon-Hydrogen
1.	Ethyne		
2.	Ethene		
3.	Ethane		

What have I learnt?

_____ bond between Carbon-Carbon of Ethyne breaks down to generate _____ free bonds for addition of a monovalent atom. Therefore, single molecule of Ethyne can add _____ molecules of a Hydrogen to give Ethane

What am I curious to learn?

- Let us make similar structures for Propene, Propyne, Butene and Butyne. Try adding Hydrogen, Chlorine or Bromine to each of the above chemical

compounds. Name the chemical compound produced by after adding each above gases.

Let me evaluate myself

Q1. Define Addition Reaction.

Q2. Rewrite the above reactions in form of chemical equations.

Q3. Which catalyst is used for Hydrogenation reactions? What is the role of a catalyst in the above reactions?

Q4. Write any one industrial application of Addition reaction

Q5. How can we differentiate between butter and cooking oil using Bromine water?

ANNEXURE 4B, 4b

ACTIVITY- TO SHOW THAT THE HARDNESS OF WATER IS CAUSED DUE TO THE PRESENCE OF SALTS OF CALCIUM AND MAGNESIUM.

Class-X Duration-40 mins

Nature of the Activity- Individual

Learning Outcome-

Students will be able to differentiate between hard water and soft water

What we have to do?

To show that the hardness of water is caused due to the presence of salts of Calcium and magnesium.

What do we require?

Test tubes, test tube stand, soft water (distilled water), soap solution, detergent solution, calcium and magnesium bicarbonates, two small pieces of curry stained cloth.

What do we need to know?

Hard water is water that has high mineral content (in contrast with "soft water"). In domestic settings, hard water is often indicated by a lack of foam formation when soap is agitated in water, and by the formation of limescale in kettles and water heaters

How will you proceed?

➤ Teacher's Activity

Teacher will brief the activity and make necessary arrangements for the activity

➤ **Student's Activity**

- a) Take one test tube, label it as A add a small amount of distilled water (5 mL) to the test tube and add five drops of soap solution on the test tube.
- b) Observe and record the lather formed in the test-tube A and keep it aside in the test tube stand.
- c) Now take another test tube and label it as B, add small of distilled water (5 ml) to the test tube. To this water add one spatula each of salts of calcium and magnesium bicarbonates and shake properly.
- d) To the above prepared sample add five drops of soap solution and shake properly.
- e) Compare the level of the lather formed in test tube A and test tube B.
- f) Observe and record the formation of scum in both the samples.

What have you observed?

	Sample A	Sample B
Presence of calcium and magnesium salts		
Measure and Record the level of the foam formed		
Scum formation		

What have you learnt?

- a) How is sample A different from sample B?

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- b) Analyze and write the reason for the difference in the level of foam formation in both the samples of water.

- c) Categorize sample A and B as hard and soft water based on above observations.

What you would be interested or curious about?

- a) How many types of hardness of water are there?

- b) How to remove both the types of hardness of water?
