Cosmo School

Work Sheet: 03

Science (Chapter-08: Chemical Reaction)

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Class: VIII

Name of the student: .....*Date:* ...../...../.....

❖ Energy and chemical energy

- Energy is defined as the ability to do work.
- Chemical energy is defined as the energy which is stored in the bonds of chemical compounds (molecules and atoms).
- Chemical reactions involve changes in energy due to the breaking and formation of bonds.

❖ Transformation of energy through chemical reaction

- **Energy transformation** is defined as the process of changing energy from one form to another.
- Most of the time, chemical energy is released in the form of heat, and this transformation from chemical energy to heat, or thermal energy, is called an **exothermic reaction**.
- Any chemical reaction that absorbs heat from its environment is called an **endothermic reaction.**
- For example—

  The dry wood is the storage of chemical energy. When it burns, the chemical energy is released and converted into light energy and thermal energy. Please note that the wood transforms into ashes which is a new substance.

Q. How does chemical reaction causes transformation of energy?

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- The first incident—

Lemon juice (Citric acid-$C_6H_8O_7$) reacts with baking soda ($NaHCO_3$) to produce sodium citrate, carbon dioxide gas and water. The test tube in which the reaction takes place cools.

Q. Why the test tube is felt cold?

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- The second incident—

Lime (CaO) reacts with acetic acid (CH_3COOH) to produce calcium acitate and water. The test tube in which the reaction takes place heats up.

Q. Why the test tube is felt hot?

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- Calcium oxide (CaO) is commonly known as **quicklime** or burnt **lime**
- Calcium oxide is **called quicklime because,** if water is dripped on it, it will hiss, pop and "come to life". In the name, 'Quick' means 'Alive' or 'Active'.
- **Slaked lime** is calcium hydroxide ($Ca(OH)_2$) which is formed by adding water to the calcium oxide.

- The third incident—

When water is added to lime (CaO), water evaporates.

$CaO + H_2O \longrightarrow Ca(OH)_2$

Q. Why does water evaporate in above reaction?

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❖ Electrolysis

- **Electrolysis** is a process by which electric current is passed through a substance to effect a chemical change.
- The materials which allows electric current to pass through its molten or dissolved state, are called electrolytes.

Q. What are non-electrolytes?

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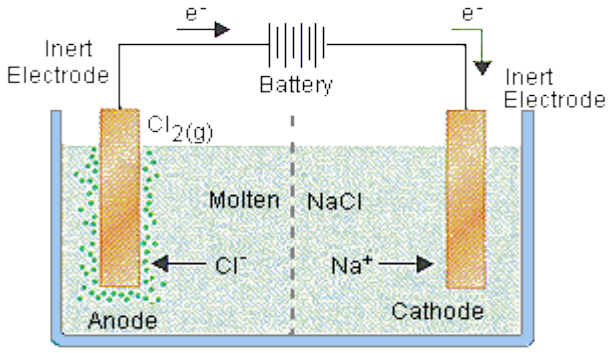
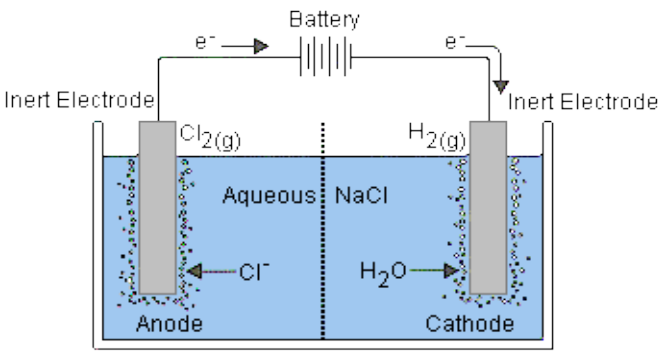
- An **electrode** is a solid electric conductor that carries electric current into non-metallic solids, or liquids, or gases, or plasmas (an ionized gas), or vacuums.
- Electrode is of two types, such as—1) Cathode and 2) Anode
- **Reduction** (gaining of electrons) takes places at the cathode. **Oxidation** (losing of electrons) takes place at the anode.

Electrolysis of Sodium chloride	
Molten NaCl	**Dissolved NaCl**
	
Reaction in anode:	**Reaction in anode:**
Reaction in cathode:	**Reaction in cathode:**