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Experiential Experimental Edutaining

CHEMISTRY

SAMPLE BOOK

8 GRADE

CHEMISTRY

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GRADE-8

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I AM PROGRESSING

(Tick mark the columns after achieving the Learning Milestones)

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 Synthetic Fibres & Plastics				
 Metals & Non-metals				
 Coal & Petroleum				
 Combustion & Flame				
 Pollution of Air & Water				

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CHEMISTRY

SAMPLE THEORY

CHAPTER 4 COMBUSTION & FLAME

INTRODUCTION

- While cooking in our homes, while celebrating festivals like Diwali, while driving vehicles, the common thing is that we are burning something because of which heat and light are produced.

Cooking of food

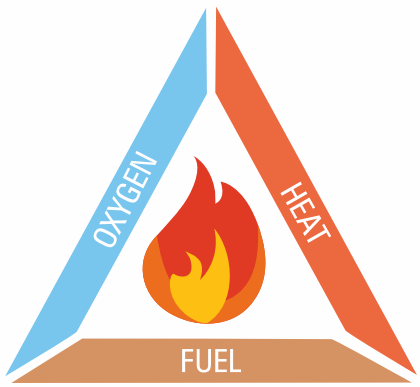
- This process is basically a chemical process in which a substance reacts with oxygen present in the atmosphere and produces heat and light, either in the form of flame or as glow and is called **combustion**.
- As heat is released in combustion, we can say that this is an exothermic process.
  Example: When we burn coal in the presence of oxygen, it gives out carbon dioxide and heat.

CONDITIONS NECESSARY FOR COMBUSTION

- There are some primary conditions necessary for combustion to occur, which can be understood with the help of the fire triangle given below.
- In this fire triangle, we can see that three things that are required for combustion are:
  1. Oxygen
  2. Fuel
  3. Ignition temperature (Heat)

  If any one requirement is missing, then combustion will not occur.

- **Ignition temperature** is the minimum temperature to which a substance must be heated so that it can catch fire, and this temperature is also known as **kindling temperature**.



Fire Triangle

Example: If we compare the burning of petrol and wood, we will see that petrol catches fire instantly while wood takes time to burn. This means that the ignition temperature of petrol is attained very fast because of which it starts burning while the ignition temperature of wood will be attained after some time.

INFLAMMABLE SUBSTANCES

- The substances with very low ignition temperature and which can easily catch fire, producing a flame, are known as **inflammable substances**.
  Examples: LPG, kerosene, petrol, alcohol, etc.

COMBUSTIBLE & NON-COMBUSTIBLE SUBSTANCES

- The substances that can burn easily and undergo combustion are known as **combustible substances** and can also be called as **fuels**.
  Examples: LPG, coal, kerosene, wood, paper, CNG, etc.
- On the other hand, the substances which do not burn quickly and do not undergo combustion are known as **non-combustible substances**.
  Examples: Stone, water, sand, glass, etc.

TYPES OF COMBUSTION

ON THE BASIS OF SUPPLY OF OXYGEN AND PRODUCTS FORMED

Complete combustion

Combustion which takes place in sufficient oxygen, is known as complete combustion. The products formed are carbon dioxide, water, heat, and light.

Incomplete combustion

Combustion which takes place in insufficient oxygen, is known as incomplete combustion. Carbon monoxide, soot, water, heat, and light are the products formed.

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SAMPLE EXERCISE

EXERCISE

GRADE-8

Combustion & Flame

Directions: Solve each of the following multiple choice questions by choosing the most appropriate option.

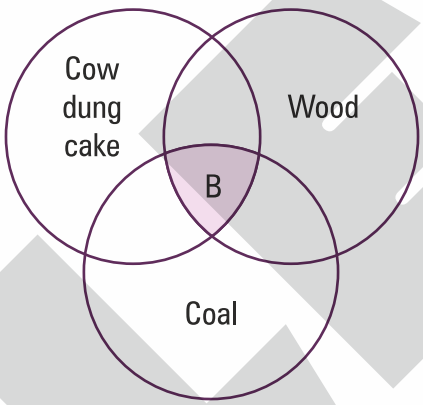
1. Which of the following is not a characteristic of a good fuel ?

(1) Easy to store
(2) Very expensive
(3) Large calorific value
(4) Moderate ignition temperature

2. The amount of energy produced on complete burning of one kilogram of fuel in the presence of oxygen is called _____.

(1) calorific value (2) ideal fuel (3) cow dung cake (4) liquid fuel

3. A Venn diagram has been given below. Select the correct option for B.



(1) Solid fuels
(2) Calorific value = 800 kJ/kg
(3) Primary fuels
(4) Derived fuels

4. Read the statements given below and select the correct option.

Statement 1: Hydrogen has the highest calorific value amongst all the fuels.

Statement 2: Burning of hydrogen gas produces harmful emissions.

(1) Both the statements are true.
(2) Only statement 1is true.
(3) Only statement 2 is true.
(4) Both the statements are false.

5. Which of the following is a disadvantage of hydrogen as a fuel ?

(1) Large calorific value
(2) Moderate ignition temperature
(3) Low ignition temperature
(4) It leaves no residue

6. Which of the following is necessary for producing and sustaining combustion ?

(1) Presence of a combustible substance
(2) Presence of a supporter of combustion
(3) Attainment of ignition or kindling temperature
(4) All of these

Direction (Q. 7 to Q. 9): Refer to the word grid given below and answer the questions that follow.

B	K	R	R	C	H	I	F	K	Q	Q	F
I	A	W	G	M	Y	M	G	E	P	B	D
O	B	C	M	O	D	S	S	R	E	L	P
G	Y	N	H	O	R	T	F	O	T	Z	E
A	M	G	H	M	O	Y	B	S	R	N	O
S	D	Q	U	B	G	E	F	E	O	P	Q
O	H	S	H	C	E	V	D	N	L	F	Y
E	U	B	Y	O	N	B	R	E	F	N	B

7. **The total number of fuels present in the above word grid are _____.**

(1) 4 (2) 5 (3) 8 (4) 2

8. **The total number of gaseous fuels present in the above word grid are _____.**

(1) 2 (2) 3 (3) 4 (4) 5

9. **The total number of liquid fuels present in the above word grid are _____.**

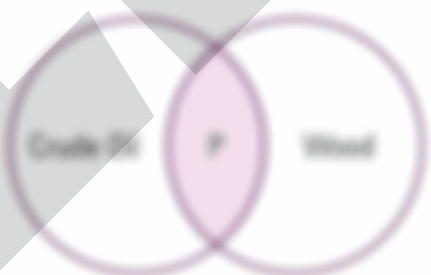
(1) 4 (2) 6 (3) 3 (4) 7

10. **The substances which have very low ignition temperature and can easily catch fire with a flame are called _____.**

(1) inflammable substances (2) slow combustion

(3) explosion (4) rapid combustion

11. **Refer to the Venn diagram given below and select the correct option for P.**



(1) Primary fuels (2) Natural fuels

(3) Derived fuels (4) Both (1) and (2)

12. **Which of the following is also known as kindling temperature ?**

(1) Ignition temperature (2) Boiling temperature

(3) Melting temperature (4) Heating temperature