

GIRLS' HIGH SCHOOL & COLLEGE, PRAYAGRAJ

WORKSHEET 3

SESSION 2020-21

CLASS- 9 A, B, C, D, E, F

SUBJECT: CHEMISTRY

INSTRUCTIONS: Parents are expected to ensure that the student spends two days to read and understand the topics of the chapter according to the books and websites referred and thereafter answer the given questions.

Chapter-Chemical changes and reactions

Note: Student should refer to books of Class 6, 7, 8 & class 9 book "Concise Chemistry by Dr. S P Singh(Selina Publications)" for reference and also the following websites:

www.wikipedia.com or chem.libretexts.org or
<https://www.youtube.com/watch?v=lCeGJnbWllw&feature=youtu.be>

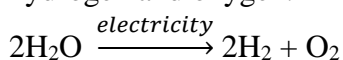
Chapter at a glance

- A chemical change is a permanent change in which the chemical composition of a substance is changed and one or more new substances with different chemical compositions and different properties are formed.
- A chemical reaction is the process of breaking the chemical bonds of reactants and formation of new bonds to form new products.
- Chemical changes occur by:
 - (i) Contact
 - (ii) Mixing the substances in solution state.
 - (iii) Heating
 - (iv) Action of light
 - (v) Electricity
 - (vi) Pressure
 - (vii) The presence of a catalyst
- ❖ Example of two solids, lead nitrate (white) and potassium iodide (white) reacting to make lead iodide (yellow) when brought into close contact.
$$\text{Pb}(\text{NO}_3)_2 (\text{s}) + 2\text{KI} (\text{s}) \rightarrow 2\text{KNO}_3 (\text{s}) + \text{PbI}_2 (\text{s})$$
- ❖ Example of oxalic acid crystals and sodium carbonate reacting in water solution only.
- ❖ Example of copper carbonate which decomposes on heating into copper oxide and carbon dioxide.
$$\text{CuCO}_3 (\text{s}) \xrightarrow{\Delta} \text{CuO}(\text{s}) + \text{CO}_2(\text{g})$$

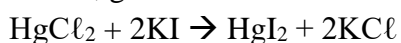
- ❖ Example of plants forming glucose from carbon dioxide and water in the presence of light.



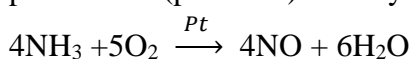
- ❖ Example: Electrolysis of acidulated water occurs only in the presence of electricity, to give hydrogen and oxygen.



- ❖ Example: Mercuric chloride and potassium iodide when rubbed (subjected to pressure) in a mortar, give a scarlet-coloured substance called mercuric iodide.



- ❖ Example: Ammonia reacts with oxygen to produce nitric oxide and water vapour in the presence of (platinum) a catalyst.

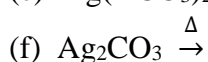
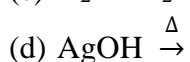
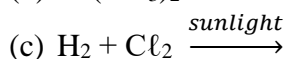
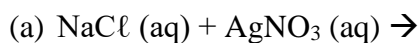


Answer the following questions based on the above explanation:

Q1) Define the following terms:

- Chemical bond
- Effervescence
- Precipitate

Q2) Complete and balance the following reactions:



Q3) Write a balanced chemical equation when Potassium chlorate decomposes at 300°C in the presence of catalyst manganese dioxide.

- Certain chemical reactions are characterized by typical changes that are quite easily observed as:

- Evolution of gas
- Change of colour
- Formation of precipitates
- Change of state

Q4) Give an example of each of the following changes:

- (a) A reaction involving blue solution.
- (b) A reaction involving formation of dirty green precipitate.
- (c) Two gases combine to form a white solid.
- (d) Two solids combine to form a liquid.
- (e) A reaction involving evolution of gas.

Q5) Give reason for the following:

- (a) Silver nitrate solution is kept in coloured bottles.
- (b) Molybdenum is used in the manufacture of ammonia.

➤ Types of chemical reaction:

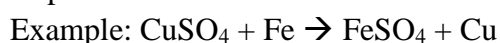
1) A reaction in which two or more substances combine to form a new substance is called a combination reaction.



2) A reaction in which a substance is broken down into two or more substances is called a decomposition reaction.



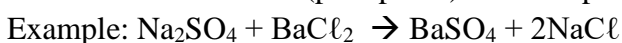
3) A reaction in which one part of a molecule is replaced by another is called a displacement reaction.



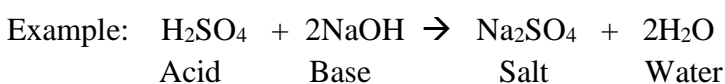
4) A reaction in which two reacting molecules exchange their corresponding ions, is called a double decomposition reaction.



➤ A reaction in which one of the products formed is an insoluble substance that is thrown out of the solution as solid (precipitate) is called precipitation reaction.



➤ The reaction between an acid and a base that forms salt and water only is the reaction of neutralization.



Now answer the questions that follow:

Q6) State into which of the following types mentioned in brackets the reactions given below can be classified:

[Decomposition, displacement, direct combination, double decomposition]

- (a) $\text{Cl}_2 + 2\text{KBr} \rightarrow 2\text{KCl} + \text{Br}_2$
- (b) $\text{NaOH} + \text{HCl} \rightarrow \text{NaCl} + \text{H}_2\text{O}$
- (c) $\text{CaCO}_3 \rightarrow \text{CaO} + \text{CO}_2$
- (d) $2\text{Mg} + \text{O}_2 \rightarrow 2\text{MgO}$

Q7) Explain and give one example for each of the following chemical changes:

- (a) Thermal dissociation
- (b) Reversible reaction
- (c) Thermal decomposition

Q8) What is synthesis? Give example.

Q9) Write balanced equations for the thermal decomposition of the following compounds:

- (a) Copper hydroxide
- (b) Magnesium carbonate
- (c) Copper carbonate
- (d) Sodium bicarbonate
- (e) Calcium nitrate
- (f) Silver nitrate

Q10) Give example of a neutralization reaction:

- (a) When a soluble base reacts with an acid.
- (b) When an insoluble base reacts with an acid.

➤ Energy changes in a chemical reaction can be in the form of heat, light, sound and electricity.

➤ Depending upon the energy released or absorbed, chemical reactions are of two types:

- 1) Exothermic
- 2) Endothermic

Answer these questions:

Q11) Define exothermic and endothermic reactions. Give an example in each case.

Q12) Define Photochemical reaction. Give one example.

Q13) Define Electrochemical reaction. Give one example.

➤ Observation is what you observe when an experiment is performed. Observation can be the characteristic colour, odour, nature of the gas evolved or it could be some specific coloured precipitate formed.

Answer the following questions as directed:

Q14) What do you observe when (write only one relevant observation):

- (a) Lead nitrate is heated.
- (b) Silver chloride is exposed to sunlight.
- (c) Barium chloride is added to sodium sulphate solution.

Q15) Name the following compounds:

- (a) A carbonate which does not decompose on heating.
- (b) A nitrate which produces oxygen as the only gas on heating.

“END”