Question 1:Why should a magnesium ribbon be cleaned before burning in air?Solution:Magnesium bea very reactive metal it reacts with oxygen and forms a layer of MgO(magnesium oxide) on the surface of metal. Magnesium oxide is a stable compound and does not react any further. Hence, magnesium ribbon has to becleaned withsand paper used forremoval of this layer.

Question 2: Write the balanced equation for the following chemical reactions. (i) Hydrogen + Chlorine → Hydrogen chloride (ii) Barium chloride + Aluminiumsulphate→ Bariumsulphate + Aluminumchloride(iii) Sodium + Water →Sodium hydroxide + HydrogenSolution: (i) 222H ClHCl+→(ii) ()()224433224433332BaClAl SOBaSO AlClBaClAl SOBaSOAlCl+→ ++→ +(iii)22222 2 2Na H ONaOH HNaH ONaOH H+ → ++ → +

Question 3:

Write a balanced chemical equation with state symbols for the following reactions. (i)Solutions of barium chloride and sodium sulphate in water react to give Insolublebarium sulphate and the solution of sodium chloride. (ii)Sodium hydroxide solution (in water) reacts with hydrochloric acidsolution(in water) to produce sodium chloride solution and water.Solution:(Inwater) to generate sodium chloride solution and water.(i) 22442244 2BaClNa SOBaSONaClBaClNa SOBaSONaCl+ → ++ → +(ii)2NaOHHClNaCl H O+ → +

Question 1

A solution of a substance ‘X’ is used for white washing. (i) Name the substance ‘X’ and write its formula. (ii) Write the reaction of the substance ‘X’ named in (i) above with water.

Solution:(i) Substance X is calcium oxide (common name quick lime). Its chemical formula isCaO.(ii) Calcium hydroxide is formed when Calcium oxide reacts with water to. This is acombination reaction.()22CaO H O Ca OH+→

Question 2: Why is the amount of gas collected in one of the test tubes in Activity 1.7 double of the amount collected in the other? Name this gas.

Solution:

Water()2HOis made up of oxygen and hydrogen. Two atoms of hydrogen()2Hand one atom of the oxygen()2Oproduce two molecules of water. Duringelectrolysis,hydrogen goes to the cathode and oxygen to the anode. The ratio of hydrogen()2Hand oxygen()2Ois 2:1. 2222 2H OH O+→

Question 1: Why does the colorof copper sulphate solution change when an iron nail isdipped in it?Solution: When iron nail is dipped in the copper sulphate()4CuSOsolution, the more reactive metal (Iron) replaces the less reactive metal (Copper) from the copper sulphate()4CuSOsolution. Iron then forms a green compoundcalled ferroussulphate()4FeSO.44Fe CuSOFeSO Cu+ → +Question 2:Give an example of a double displacement reaction other than the one given in Activity1.10.Solution:(i) ()()()()222 KBr aqBaI aqaq BaBr s+→ +(ii) ()323222KI Pb NOPbIKNO+→ +Question 3:

Identify the substances that are oxidized and the substances that are reduced in the following reactions. (i) 4Na (s) + O2 (g) → 2Na 2O(s) (ii) CuO (s) + H2 (g) → Cu(s) + H2O(l)Solution:(i) Sodium [Na]is oxidized and oxygen gets reduced. ()()()224 2Na sO gNa O s+→(ii) Hydrogen (H2) is oxidized to water (H2O) and Copper oxide ()Cu Ois reducedto copper (Cu)

Which of the statements about the reaction below are incorrect? 2PbO(s) + C(s) → 2Pb(s) + CO2(g) (a) Lead is getting reduced. (b) Carbon dioxide is getting oxidized. (c) Carbon is getting oxidized. (d) Lead oxide is getting reduced. (i) (a) and (b)(ii) (a) and (c) (iii) (a), (b) and (c) (iv) allSolution:As it is clearly evident from the reaction that Pb is getting oxidized and CO2is getting reduced. Thus, (i) (a) and (b)is correct answer

Question 2: Fe2O3+ 2Al → Al2O3+ 2Fe theabove reaction is an example of a (a) Combination reaction. (b) Double displacement reaction.(c) Decomposition reaction. (d) Displacement reaction.Solution:(d) This is anexampleof a displacement reaction.Question 3:What happens when dilute hydrochloric acid is added to iron filings? Tick the correct answer. (a) Hydrogen gas and iron chloride are produced.(b) Chlorine gas and iron hydroxide are produced.(c) No reaction takes place. (d) Iron salt and water are produced.Solution:(a)Hydrogen gas[H2]and ironchloride[FeCl2]. The reaction is as follows:Fe + 2HCl → FeCl2+ H2Question 4: What is a balanced chemical equation? Why should chemical equations be balanced?Solution:In a balanced chemical reaction, the net mass of the reactants should be equal to the net mass of products and the number of atoms in the reactants side should be equal to the number of atoms in products side.Achemical equation mustbebalancedto follow the Law of Conservation of mass.

Question 5

Translate the following statements into chemical equations and then balance them. (a) Hydrogen gas combines with nitrogen to form ammonia. (b) Hydrogen sulphide gas burns in air to give water and sulpurdioxide.(c) Barium chloride reacts with aluminiumsulphate to give aluminiumchloride and a precipitate of barium sulphate.(d)Potassium metal reacts with water to give potassium hydroxide and hydrogengas.Solution:(a)N2(g) + 3H2(g) → 2NH3(g) + HeatNitrogen+ Hydrogen→ Ammonia(b) 2H2S(g) + 3O2(g)→ 2H2O(aq)+2SO2(g)Hydrogen sulphide+ oxygen→Water + sulpur dioxide(c) Al2(SO4)3(aq)+3BaCl2(aq)→ 2AlCl3(aq)+ 3BaSO4(s)Aluminiumsulphate + Bariumchloride →Aluminiumchloride +Bariumsulphate(d) 2K(s) + 2H2O → 2KOH(aq) + H2(g)Potassium+water→potassium+ hydroxideQuestion 6:Balance the following chemical equations. (a) HNO3+ Ca(OH)2→ Ca(NO3)2+ H2O (b) NaOH + H2SO4→ Na2SO4+ H2O (c) NaCl + AgNO3→ AgCl + NaNO3(d) BaCl2+ H2SO4→ BaSO4+ HCl

Solution:

()()()33222a HNOCa OHCa NOH O+→+2HNO3+ Ca(OH)2=Ca(NO3)2+2H2ONitric Acid +Calcium hydroxide = calcium nitrate water()24242b NaOHH SONa SOH O+ → +2NaOH+H2SO4=Na2SO4+2H2OSodium Hydroxide+SulfuricAcid=Sodium Sulfate+Water()33c NaClAgNOAgClNaNO+ → +The equation is already balanced.()244 2d BaClH SOBaSOHCl+ → +BaCl2+H2SO4=BaSO4+2HClBarium Chloride+Sulfuric Acid=Barium Sulfate+Hydrogen ChlorideQuestion 7: Write the balanced chemical equations for the following reactions. (a) Calcium hydroxide + Carbon dioxide → Calciumcarbonate + Water (b) Zinc + Silver nitrate→ Zincnitrate + Silver (c) Aluminum+ Copper chloride →Aluminumchloride + Copper (d) Barium chloride + Potassium sulphate →Barium sulphate + Potassium chloride Solution:()a Calcium hydroxide + Carbon dioxide Calcium carbonate + Water →The balanced reaction is Ca (OH)2+ CO2→ CaCO3+ H2O()b Zinc +Silver nitrate Zinc nitrate +Silver→

Zn + AgNO3→ Zn(NO3)2+ AgZn + 2AgNO3→ Zn(NO3)2+ 2Ag(c) Aluminum +Copper chloride → Aluminum chloride+ CopperAl + CuCl2→ AlCl3+ Cu2Al + 3CuCl2→ 2AlCl3+ 3Cu()d Barium chloride + Potassium sulphate Barium sulphate + Potassium Chloride→BaCl2+K2SO4→ BaSO4+ KClBaCl2+K2SO4→ BaSO4+ 2KClQuestion 8: Write the balanced chemical equation for the following and identify the type ofreaction in each case.(a) Potassium bromide (aq) + Barium iodide (aq) → Potassiumiodide (aq) + Barium bromide(s) (b) Zinc carbonate(s) → Zincoxide(s) + Carbon dioxide (g) (c) Hydrogen (g) + Chlorine (g) → Hydrogenchloride (g) (d) Magnesium(s) + Hydrochloric acid (aq) → Magnesiumchloride (aq) + Hydrogen(g)Solution:(a)KBr(aq)+BaI2(aq)→KI(aq)+BaBr2(s)2KBr(aq)+BaI2(aq)→2KI(aq)+BaBr2(s)Thisisadoubledisplacementreaction.(b)ZnCO3(s)→ZnO(s)+CO2(g)Thisisadecompositionreaction.(c)H2(g)+Cl2(g)→HCl(g)H2(g)+Cl2(g)→2HCl(g)Thisisacompositionreaction.(d)Mg(s)+HCl(aq)→MgCl2(aq)+H2(g)Mg(s)+2HCl(aq)→MgCl2(aq)+H2(g)

Thisisasingledisplacementreaction.Question9:Whatdoesonemeanbyexothermicandendothermicreactions?Giveexamples.Solution:ExothermicReaction:Thereactionsinwhichheatisreleasedalongsidewiththeformationofproductsaretermedasexothermicreaction.Here,theenergyofthereactantsismorethanthatoftheproducts.i.e.Energyofreactants>energyofproductsExample:combustionofmethaneCH4(g)+2O2(g)→CO2+2H2O+heatEndothermicReaction:Thereactioninwhichenergyisabsorbedbythereactantstocompletethereactioniscalledendothermicreaction.Here,theenergyofthereactantsislessthanthatoftheproducts.i.e.Energyofreactants<energyofproductsExample:PhotosynthesisQuestion10:Whyrespirationisconsideredanexothermicreaction?Explain.Solution:Asexplainedinpreviousquestionexothermicreactions release heat or energy. Duringdigestion, the food is broken to form glucose. Glucose then combines with oxygen inthe cells of our body and provides energy. This reaction is termed as respiration. Since energy is released along the products it is an exothermicreactionGlucose + oxygen →CO2+water+heatQuestion 11: Why decomposition reactions arecalled the opposite of combination reactions? Write equations for these reactions.Solution:In a Decomposition reaction a single reactant breaks down into various products. Example:Decomposition of calcium carbonate [CaCO3]to form calcium oxide [CaO] andcarbon dioxide[CO2]

CaCO3+ Energy →CaO + CO2 On the other hand, Combination reactions are those reactions in which two or more reactants combine to form a single product. Example:Combination of Calcium oxide and carbon dioxide to produce calcium carbonate. CaO+ CO2→ CaCO3+ energyQuestion 12: Write one equation each for decomposition reactions where energy is supplied in the form of heat, light or electricity.Solution: (i) Thermal decompositionCaCO3+heat → CaO+ C(ii) Electrical decomposition2H2O +electricity →2H2+ O2 (iii) Photolytic decomposition2AgCl +sunlight →2Ag + Cl2Question 13: What is the difference between displacement and double displacement reactions? Write equations for these reactions.Solution: Question 14: In the refining of silver, the recovery of silver from silver nitrate solution involved displacement by copper metal. Write down the reaction involved.Solution:DisplacementDouble displacementa comparatively more reactive element displaces a less reactive element from its compoundtwo compounds react by swapping ions to form two new compoundsEg.2323Fe O2Al Al O 2Fe+ → +Eg. 2KBr(aq)+BaI2(aq)→2KI(aq)+BaBr2

Thesilvernitrate[2AgNO3]isinsolutionandthecopper[Cu]willdissolvetoformcoppernitrate[Cu(NO3)2];asthishappens,silverinsolutionwillprecipitateasmetallicsilver.Thatis,copperisexchangedwiththesilverinsolutionandsilverisreplacedbythecopperthatisnotinsolution.Thefollowingchemicalreactionisinvolved:2AgNO3+Cu→2Ag+Cu(NO3)2Question 15: What do you mean by a precipitation reaction? Explain by giving examples.Solution: A reaction in which an insoluble matter is formed is called a precipitation reaction. Example 1:On mixing Na2CO3solution with CaCl2solution,a white precipitateof CacO3is formed. Na2CO3+ CaCl2→CaCO3+ 2NaClQuestion 16: Explain the following in terms of gain or loss of oxygen with two examples each. (a) Oxidation (b) ReductionSolution:Oxidation: Addition of oxygen or electronegative element to a atom, molecule, or ion or removal of hydrogenor electropositive element from anatom, molecule, orionis called oxidation. Example: CO2+ H2→CO+H2O (additionof O)2Cu+O2→2CuO (additionof O)Reduction: Addition of hydrogen or electropositive element to anatom, molecule, or ionor removal ofOxygenor electronegative element from a atom, molecule, or ion is called reduction. Example: CO2+ H2→ CO+H2OCuO+ H2→ Cu+H2OQuestion 17:A shiny brown colored element ‘X’ on heating in air becomes black in colour. Name the element ‘X’ and the black colored compound formed.

Solution:Copper (Cu) is the given element X and the black color compound is copper (II) oxide(CuO). Here copper reacts with oxygen to form the copper (II) oxide.2Cu + O2→ 2CuOShinybrown blackQuestion 18: Why do we apply paint on iron articles?Solution:Iron articles get corroded easily in the presence of moisture and air. To prevent rusting, we have to paint iron Articles. When we apply paint on the iron articles it cuts the contact of moisture and air with the surface and preventscorrosion.Question 19: Oil and fat containing food items are flushed with nitrogen. Why?Solution:Oil and fat containing food items get oxidized easily when they come in contact with oxygen. On the other hand nitrogen is an inert gas thus does not react easily. So the packets are flushed with nitrogen which replaces oxygen inside the packets. In this way, we can preserve food containing oiland fats for a long time. Question 20:Explain the following terms with one example each. (a) Corrosion (b) RanciditySolution:(a) Corrosion:Corrosion is defined as a natural process in which the substance, usually metals oxidizes in the presence of air and moisture .Metal converts into its hydrated oxide. Ex: Iron

Rancidity: Rancidity is defined as a process in which fats and oils are oxidized. This can be identified by change in taste and smell. For example, when you will keep for a long time any chips packet then the taste and smell of chips changes.