MERRYLAND HIGH SCHOOL ENTEBBE

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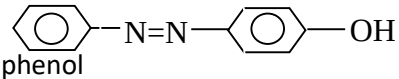
S6 CHEMISTRY HOLIDAY WORK

TERM ONE 2020

1. Write Equations to show how the following compounds can be synthesized
   (a) CH_3CH_2COOH from ethanol
   (b) phenyl methanal (benzaldehyde) from benzoic acid
   (c) $CH_3CH_2CH_2NHCH_3$ from propene
   (d) $(CH_3)_2C=N-NHCONH_2$ from ethanol
   (e) benzene to 
   (f) propene to phenol
2. The elements sodium, aluminium, silicon, phosphorous, sulphur and chlorine belong to period 3 of the Periodic Table.
   (a) Explain the differences in the melting points of the elements.
   (b) Describe the reactions of
      (i) Aluminium, silicon, phosphorous and chlorine with sodium hydroxide.
      (ii) The hydride of sodium, silicon and sulphur with water.
      (iii) aluminium with sulphuric acid
      (iv) the chlorides of aluminium, silicon and phosphorous with water
3.
   (a) Define the terms
      (i) a colligative property
      (ii) boiling point constant
   (b) Describe the experiment that you would carry out to determine the relative molecular mass of s compound using boiling point method. Use a diagram to illustrate your answer.
   (c) Explain the effect of association of the solute on its value of relative molecular determined by the boiling point method.
   (d)
      (i) State the laws of osmotic pressure.
      (ii) State the conditions under which these laws are valid
   (e) The osmotic pressure of a 1.42% solution of polyvinyl chloride is 2.356×10^{-2} mmHg at 25^0.
      (i) Calculate the relative molecular mass of polyvinylchloride.
      (ii) Calculate the number of monomer unit of polyvinylchloride.
      (iii) Write equation for the formation of polyvinylchloride from chloroethene.

4.

(a) Describe the reaction of
   (i) ethanol with sulphuric acid
   (ii) benzene with chlorine
   (iii) propanoic acid with methanol
   (iv) nitrous acid with amines

(b) write equation for the reaction and indicate the mechanism for the reaction between
   (i) chloroethane and phenol in presence of sodium hydroxide solution
   (ii) propanone and 4-nitrophenylhydrazine in acidic medium.
   (iii) 1-methylcyclohex-1-ene and bromine water.

5.

(a) What is meant by the term electron affinity?

(b) The first electron affinities of group (VII) elements are shown below.

Element	Fluorine	chlorine	bromine	Iodine
Atomic number	9	17	35	64
Electron affinity ($kJmol^{-1}$)	-328	-349	-325	295

   (i) Plot a graph of first electron against atomic number
   (ii) Explain the shape of the graph

(c) State three reasons why fluorine differs in some reactions from group(VII) elements.

(d) state four properties in which fluorine differs from other group(VII)

(e) Describe the reaction of group(VII) elements
   (i) with water
   (ii) with sodium hydroxide

(f) Write equations for the reactions between the hydride of group (VII) with concentrated sulphur acid.

(g) Describe briefly how you would prepare crystals of potassium chlorate.

END