

Questions
Bank

Eng. Chemistry

1. Atomic structure :-

(2 marks) Short Questions :-

Q.1(a) Charge of electron is _____.

Mass of electron is _____.

(b) What is the charge and mass of proton?

(c) Find the numbers of electron, proton & neutron present in Cl^- ; O^{2-} .(d) Find the numbers of proton & electron present in Ca^{2+} .

(e) An element having protons = 19 and neutrons = 20, Then identify & calculate the mass of that element.

(f) Write the electronic configurations of

(i) Cu (ii) Cr

(g) Write the electronic configuration of O^{2-} , N^{3-} , Cl^- , Na , Ca^{2+} , Fe , Fe^{2+} , Co .

(h) Define (i) isotope with example. [2]

(ii) isotope with example. [2]

(iii) isobar with example [2]

(i) state (i) Pauli's exclusion principle. [2]

(ii) Hund's rule. [2]

(iii) Aufbau's principle. [2]

(j) What is (n+l) rule? arrange 1s, 2p, 3s, 3p, 4s, 3d in the increasing order of their energy.

Long type Questions:-

(10)

- (2) (a) State and Explain Rutherford's gold foil experiment. [7]
- (b) Write the Drawbacks of Rutherford's atomic model. [4]
- (c) Write the postulates of Bohr's atomic model. How Bohr rectified the Rutherford's atomic model? [5+3]
- (d) Write the postulates of Bohr-Bury Scheme. [4]

2. Chemical Bonding

Short Questions:-

- (1) Define (a) ionic bond with example [2]
(b) covalent bond with example [2]
(c) coordinate bond with example [2].
- (2) Identify the covalent, ionic & coordinate compounds [2] from the following H_2O_2 , NH_4^+ , O_2 , $NaCl$, CO_2 , $MgCl_2$.

Long Questions:-

- (1) Write the difference between ionic compound and covalent compound. (Any four points) [4]
- (2) Explain the formation of (a) NH_3 molecule [4]
(b) NH_4^+ molecule [4]
(c) H_2O molecule [4]
(d) CH_4 molecule [4]
(e) H_3O^+ molecule [4]

3. Acid, Base and salt

(03)

Short Questions:-

1(a) Define conjugate acid-base pairs of a substance. [2]

(b) What is the conjugate acid-base pairs of

(i) HCl [2]

(v) HCO_3^- [2]

(ii) H_2SO_4 [2]

(vi) HCOOH [2]

(iii) H_2O [2]

(iv) NH_4^+ [2]

(2) Write the limitation of Arrhenius concept. [2]

(3) What are the advantages of Bronsted-Lowry concept over the Arrhenius concept. [2]

(4) Write the limitation of Bronsted-Lowry concept.

(5) Define amphoteric substance, give any two examples.

Long Questions:- [4-marks]

(1) Compare Arrhenius concept with Lowry-concept.

(2) What are the salient features of Lewis concept?

(3) Compare Lowry concept with Lewis concept. [2]

4. [Salts]

Short Question

(1) Define salt / neutralisation reaction with eg. [2]

(2) What is difference between the double salt and complex salt [2].

(3) What is double salt give any one example.

Long Question:-

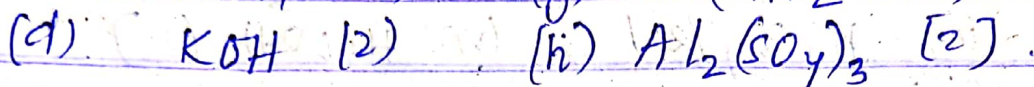
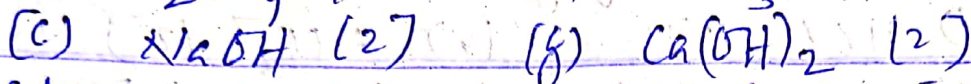
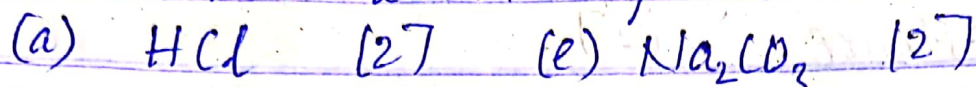
(1) Define salt & explain about various types of salt. [7]

5. Solutions

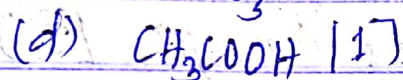
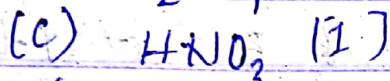
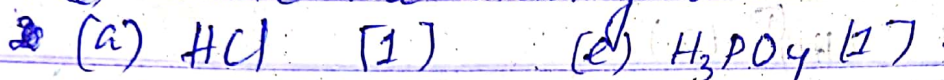
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Short Question:-

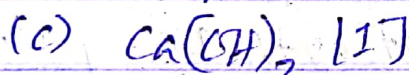
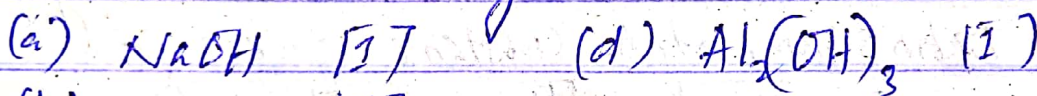
(1) Calculate the Gram equivalent mass of



(2) Write the basicity of



(3) Write the acidity of



(4) Define (a) Normality [2]

(b) Molarity [2]

(c) Molality [2]

(5) (a) Calculate the molarity of a solution contain 4.9 gm of H_2SO_4 in 2 litre of its solution. [2]

(b) Calculate the molarity of a solution contain 4.0 gm of NaOH in 500ml of its solution. [2]

(c) Calculate the normality of a solution contain 5.3 gm of Sodium bicarbonate in 2 lit. of its solution. [2]

(d) Calculate the normality of a solution contain 9.8 gm of H_2SO_4 in 2 lit. of its solution.

- (e) Calculate the molality of 2.5 gm of Na_2CO_3 in 150 gm of water. (2)
- (f) 4.9 gram of H_2SO_4 is present in 2 litre of its solution having density 1.4 gm/l. Calculate molality of the solution. (2)
- (g) Calculate the molality of 0.1 M solution of KCl. The density of the solution is 0.12 gm/ml. (2)
- 6(a) Convert 10^{-2} M H_2SO_4 into Normality?
- 7(a) Calculate the amount of solute present in
 (a) 0.01 M, 500 ml H_2SO_4 (2)
 (b) 300 ml, 0.1 M HCl (2)
 (c) 0.1 M 1 lit. KOH (2).
- (8) How much sodium carbonate is required to prepare a 1N solution. (2)

6. (PH)

Short Question:-

- (1) Define pH. (2)
- (2) Calculate the pH of
 (a) 0.001 N HNO_3 (2)
 (b) 0.01 N H_2SO_4 (2)
 (c) 0.001 M KOH (2)
 (d) 0.0001 M NaOH (2)
- (3) Calculate the pH of a solution contain 4.9 gm of H_2SO_4 in 2 lit. of its solution.

Long Questions:-

[5]

Q. (1) How many grams of KOH are required to prepare 2 litres of its solution having pH = 12.

(2) Calculate the pH of a solution contain 4.0 gm of NaOH present in 1 litre of its solution.

(3) 11.2 g. of caustic potash are present in 5 lit in its solution. Find the pH of the solution.

(4) Write the application of pH in paper industry, sugar industry.

7. ElectrochemistryShort Questions:-

Q. (1) Define

(a) electrolysis [2]

(b) electrolytes [2]

(2) Define electrochemical equivalent. [2]

(3) What is Faraday's constant. [2]

Long Questions:-

Q. 1. Define electrolysis. State and explain Faraday's 1st law of electrolysis. [6]

(2) State and explain Faraday's 2nd law of electrolysis.

(3) State and explain Faraday's 1st law of electrolysis. Find the mass of copper deposited from CuSO_4 solution by a current of 0.25 ampere flowing for 1 hr. (At. mass of Cu = 63) [6]

Q(4) Write short notes on.

- (a) electrolysis [4]
- (b) electroplating (5)
- (c) electrorefining (5).

8. Corrosion

Short question:-

- Q.1(a) Define Corrosion. Give any two examples. [2]
- (b) Define rusting of iron. What is the formula of rusted iron. [2]
- (c) What is galvanisation? [2].

Long question:-

- 1(a) What is atmospheric corrosion? Explain the mechanism of rusting of iron. [2+5]
- (b) Explain waterline corrosion. [5]

(Short Qsn) 9. Metallurgy:-

- 1(a) Define Ore with an example. [2]
- (b) What is the difference between ore and mineral. [2]
- (c) What is gangue. [2]
- (d) What is flux. [2]
- (e) What is concentration. [2]

2. Define (a) Calcination [2]
 (b) Roasting [2]
 (c) Smelting [2]
 (d) Leaching [2]
 (e) Oxidation. [2]

Long question:-

- (1) Write notes on
 (a) Gravity separation [5]
 (b) Magnetic separation [5]
 (c) Froth Flotation [5]
2. What is flux. Explain about different types of flux. [5].

10. Alloy

short questions:-

- 1(a) Define alloy & give an example. [2].
 (b) What is the difference between ferroalloy and non ferro alloy. [2].
 (c) What is amalgam. [1]

Long Questions:-

- (1) Write the composition and uses of [8].
 (a) Brass (c) Alnico
 (b) Bronze (d) Duralumin

11. Hydrocarbons

short questions:-

- Q(1.) What are Hydrocarbons? give two example. [2]
(2) What is difference between saturated Hydrocarbon and unsaturated hydrocarbons. [2].
(3) Write the IUPAC name of these following compounds.

- (i) $\text{CH}_3\text{C}(\text{Br}_2)\text{CHCHCH}(\text{C}_2\text{H}_5)\text{CH}_3$ [1]
- (ii) $\text{CH}_2\text{CHCH}_2\text{CCH}$ [1]
- (iii) $\text{CH}_3\text{CHClCHClCH}(\text{OH})\text{CH}_3$ [1]
- (iv) $\text{CH}_3-\text{CHClCHBrCH}_2\text{CH}_3$ [1]
- (v) $\text{CH}_3\text{CHCHCH}_2\text{CH}(\text{Br})\text{CH}_3$ [1]
- (vi) $\text{CH}_3\text{CH}(\text{CH}_3)\text{CH}_3$ [1]
- (vii) $\text{CH}_2-\text{C}(\text{CH}_3)_2\text{CH}_3$ [1]
- (viii) $\text{CH}_2\text{C}(\text{CH}_3)\text{CH}_2\text{CH}_3$ [1]
- (ix) $\text{CH}_3\text{C}(\text{C})(\text{CH}_3)-\text{CH}_3$ [1]
- (x) $\text{CH}_3\text{C}(\text{Br})_2\text{CH}(\text{Cl})\text{CH}_3$ [1]
- (xi) $\text{CH}_3\text{CH}_2\text{CH}(\text{CH}_3)\text{CH}(\text{Cl})\text{OH}$ [1]
- (xii) $\text{CH}_3-\text{CHCHCH}_2\text{CCH}$ [1]

(4) Write the structure of these following [1x12] organic compounds:

- (i) isobutene (vii) phenol
- (ii) isopentane (viii) ethyl alcohol
- (iii) BHC (ix) 3-bromo-4-chloropent-2-en-2-ol
- (iv) isoprene (x) 4-bromo-3-nitropent-3-en-2-yne
- (v) Benzene (xi) 2-bromo-5-chloro-3,4-diethylhexane
- (vi) Benzoic acid (xii) pentenol.

Long questions:-

(10)

Q(1) Define and explain Huckel's rule of aromaticity with suitable example. [5]

Q(2) write the uses of benzoic acid, naphthalene and phenol. [6]

Q(3) write the uses of Benzene, Toluene & BHC. [6].

(short Qn) 12. Water

Q(1) what is hard water? [2]

(2) what is Temporary Hard water? [2]

(3) what is permanent Hard water? [2]

(4) How to remove Temporary Hardness of water. [2].

(5) How to remove permanent Hardness of water by using sodium carbonate? [2].

(6) How to remove permanent Hardness of water by using lime water? [2].

Long Question:-

Q(1) write the difference between Cold-lime Soda process & Hot-lime Soda process. [6]

Q(2) what are the advantages of hot-lime Soda-process over cold-lime soda process. [5]

Q(3) Explain organic ion-exchange process of water softening. [7].

13. Lubricants

(11)

Short Question:-

Q.1. Define Lubricants, give example. [2].

Q.2. Give any two example of solid-lubricants and where it is used? [2].

Long question:-

Q.1) Define Lubricants. What are the function of lubricants? [6].

(2) Write the uses of graphite, oil & grease as Lubricants.

14. Fuel

Short questions:-

Q.1) What are primary fuels? Give examples of two gaseous primary fuels? [2].

(2) Define calorific value of a fuel. [2].

Long Question:-

Q.1) Write the composition, calorific value & uses of

(a) Diesel [5]

(b) petrol [5]

(c) kerosene [5]

(2) Write the composition, calorific value & uses of

(a) water gas (b) producer gas [5+5]

(3) What are the features to choice of a good fuels ? [5]

(4) What is difference between L.P.G & LNG.

15. Polymer:-

short questions:-

Q.1 (a) Define monomer. [1]

(b) What is difference between homopolymer & copolymer. [2].

(c) Define degree of polymerization. [2].

(d) What do you mean by Vulcanised rubber.

(e) Define elastomer. [2].

Long-questions:-

(1) Write the difference between Thermosetting and Thermoplastic. [5]

(2) Write the difference between Vulcanised rubber and raw-rubber. [5]

(3) Define polymer. Write the composition and uses of polythene. [1+2+2]

(4) Write the composition & uses of

(a) poly-vinyl-chloride [5]

(b) Bakelite [5]

(5) Write the advantages of Vulcanised rubber. [5]

16. Chemicals in Agriculture

13

Short question:-

(1) What is pesticides? Give two uses of pesticides? [2].

(2) What is insecticides? Give two uses of insecticides. [2].

(3) Define Herbicides? Write two uses of Herbicides [2].

(4) Define fungicides? Write two uses of fungicides [2].

Long Question:-

(1) What are biofertilizers? Write the uses of biofertilizers in agriculture. [5].