



Chemistry

- (a) Balance the chemical equation $\text{Ca} + \text{HCl} \rightarrow \text{CaCl}_2 + \text{H}_2\text{O}$

(b) Write the balanced chemical equation to represent the burning of ethanol in air to produce carbon dioxide and water.

(c) What is the molarity of a solution that contains 7.3 gms of hydrogen chloride in 100 ml of solution.
- (a) What is meant by atomic mass unit (amu) ?

(b) Define Hund's rule.

(c) What are alpha particles ? Characterize them as to mass and charge.
- (a) Define first ionization energy.

(b) What are metalloids ? Give two examples.

(c) What is electro negativity ?
- (a) Write the electronic configuration of the ion Na^+

(b) Why is HCl molecule polar while Cl_2 molecule is non-polar ?

(c) What are oxidation numbers ?
- (a) What angles are associated with orbital's in the following set of orbital's in the following set of orbital's ? sp, sp^2 and sp^3

(b) Distinguish between Sigma bond (σ) bond and pi (π) bond.

(c) What are reversible reactions ? Give an example.
- (a) Define Avogadro's law.

(b) What is meant by bond energy ?

(c) State Hess's law of heat summation.
- (a) Why are chemical equilibria called dynamic equilibria ?

(b) What would be the effect of increasing the temperature on the following chemical equilibrium ?

$$2\text{SO}_2(\text{g}) + \text{O}_2(\text{g}) \rightleftharpoons 2\text{SO}_3(\text{g})$$

$\Delta H = -198 \text{ KJ}$

(c) Why do salts of weak bases and strong acids give acidic aqueous solution ?
- (a) Why must all radioactive decays to first order ?

(b) What is Lanthanide contraction ?

(c) Why are most transition compound coloured ?
- (a) What is meant by catenation ?

(b) What are conformations ?

(c) Why are alkynes more reactive than alkenes ?



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10. (a) Explain the bonding in benzene.
(b) What are alcohols and phenols ? How do they differ?
(c) What are fats and oils ? Write the general formula for fats and oils.