KL University
Department of Chemistry
Engineering Chemistry (11BS104)
Model Question paper

I. a) A Water sample has 126 ppm hardness. What is its hardness in French degree?
b) Calgon conditioning is better than Phosphate conditioning. Justify?
c) Bolt and nut made of same metal is preferred. Why?
d) What are the natures of aluminum oxide and magnesium oxide?
e) Why do all simple organic molecules not produce polymers?
f) Teflon is an additional polymer but it behaves somewhat like a thermo setting polymer. Give reason.
g) Why does Ag/Ag^+ (0.1M)// Ag^+ (0.1M)/ Ag constitute a cell?
h) Can we use a nickel spatula to stir a solution of copper sulphate?
i) Electrical iron poles are replaced by concrete and concrete is replaced by which material? Give 2 examples.
j) If a substance co exist in all the three phases what is that state called?

II. a) How the following are measured with the given data? R= 8.316 joules, F= 96,500 coulombs, SOP for Zn electrode = 0.765V, SOP for copper electrode = -0.337V.
i) EMF of the cell ii) Replacement tendency ii) Equilibrium constant
iv) Cell reactions and net cell reaction. v) Reaction is spontaneous or not.

b) Anode of galvanic cell is – ve and Cathode is +ve . Why?

c) How fuel cell generates voltage. Write chemical equations on involved in the process.

III a) Large cathodic areas and small anodic areas enhance rate of Corrosion. Justify by taking 2 cases.

b) How do you protect buried pipe line from Corrosion? Suggest suitable methods?

IV). a) Apply Gibbs phase rule to one component water system.

b) How the following factors influence rate of Corrosion?

i) Humidity ii) Solubility of Corrosion product

iii) O_2 concentration cell iv) Nature of surface film.

V) a) Water having the following composition has to be softened by the lime – soda process.

$Ca(HCO_3)_2$ = 220 PPM; $Mg(HCO_3)_2$ = 56ppm; Mgcl2 = 130ppm; $MgSO_4$ = 84ppm,

to soften one million liters of water? Write necessary chemical equations to remove

these impurities using lime and soda?

b) Suggest a method to separate water from contaminants. How it is carried out?

VI) a) Identify thermoplastics and thermo sets among the following: Bakelite, Dacron, Teflon, PVC, UF resin, PMMA write monomeric units for the above polymers?

b) How poly acetylene behaves like a metal. Explain?

VII) a) What are the characteristics of abrasives? Mention its important applications?

b) Design a battery that provides 12v Energy. Write to the chemical reactions involved in it.

VIII a) The following deposits were found an analysis of boiler pieces after explosion.

$Mg(OH)_2$, $MgSiO_3$, $CaCO_3$, $CaSO_4$, Na_2FeO_2, Fe_3O_4, Na_2SO_4

Investigate and brief the operational troubles.

b) For the above data predict the possible impurities present in water before explosion?

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