Applied Chemistry 2 - Dec 16

First Year Engineering (Semester 2)

Total marks: 80
Total time: 3 Hours

INSTRUCTIONS
1]Question 1 is compulsory.
*2]Attempt any **three** from the remaining questions.*
3]Use suitable data wherever required.
4]Figures to the right indicate full marks.

Solve any five questionQ.1(a,b,c,d,e,f)

1(a) Gold and plantinum do not get corroded in atmospheric oxygen. Explain. (3 marks)
1(b) Define octane number of gasoline, Name any twon anti-knock agents. (3 marks)
1(c) Give compositions, properties and uses of Duralumin. (3 marks)
1(d) Give classifications of composite material. (3 marks)
1(e) What is green chemistry? List the six principles of green chemistry. (3 marks)
1(f) A cola sample was chemistry? List the six principles of green chemistry. combustion in a Bomb-Colorimeter gave 0.67 of $BaSO_4$. Calculate percentage of sulphur. (3 marks)

2(a) How do the following factors affect the rate of corrision?
i) Position of metal in galvantic series.
ii) pH of medium
iii) Relative areas of anodic and cathodic parts. (6 marks)
2(b) What is Biodiesel? Explain method to obtain biodiesel from vegetable oil. What are the advantages of biodiesel. (5 marks)
2(c) Calculate percentage atom economy for the following reactions with respect to Acetophenone.

$$C_6H_6 + CH_3COCl \xrightarrow{AlCl_3} C_6H_5COCH_3 + HCL$$
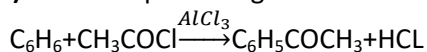
Benzene   Acetophenone (4 marks)

3(a) A Gaseons fuel has the following compositions by volume:- H=25%, CO=20% CH_4=30% C_3H_8=20% O_2=2% N_2 =1%, CO_2=2% Calculate volume and weighted of air required for complete combustion of $1m^3$ of fuel (molut of air = 28.949) (6 marks)

3(b) Explain conventional and greener route of synthesis of Adipic Acid.Highlight the green chemistry principle involved. (5 marks)

3(c) Discuss Differential Aeration corrosion with a suitable examples. (4 marks)

4(a) What is powder-meatullurgy? List the various steps involved in powder metallurgy mention the aim of each step. (6 marks)

4(b) What is cathodic protection? Describe impressed current method of corrosion control. (5 marks)

4(c) Discuss the influence of any two chemical factors of adhesion action. (4 marks)

5(a) What is cracking? Explain in detailed fixed bed catalytic cracking with suitable diagram. (6 marks)

5(b) What is an alloy? Explain any four purposes of alloying with suitable examples. (5 marks)

5(c) Write a note on 'Sandwich panel' type layered composites. (4 marks)

6(a) What are the metallic coatings? Distinguish between galavanizing and Tinning. (5 marks)

6(b) Calculate the weight and volume of air needed for complete combustion of 2 kg of coal containing:-
C=54%, H=6.5%, O=3%, W=1.8% (5 marks)

6(c) Write a note on following:-

i) Compacting ii) Sintering (5 marks)