

BE (Metallurgy and Materials) 5th Semester Examination – 2011

Subject: Polymer and Refractories (CH – 501)

Time: 2 hrs

Full Marks: 35

Answer any five questions

1. Write short note on

(i) Refractoriness (ii) Thermal spalling of refractories

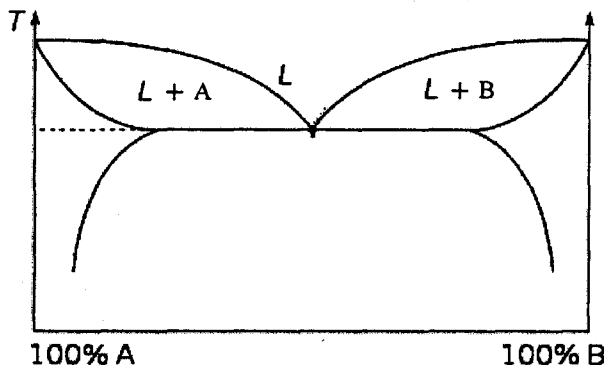
$$3\frac{1}{2} + 3\frac{1}{2} = 7$$

2. (a) What do you mean by apparent and true porosity of refractories?

(b) Describe boiling point method for determination of porosity of refractories.

$$3 + 4 = 7$$

3. (a) Define eutectic composition, point and temperature from the given phase diagram.

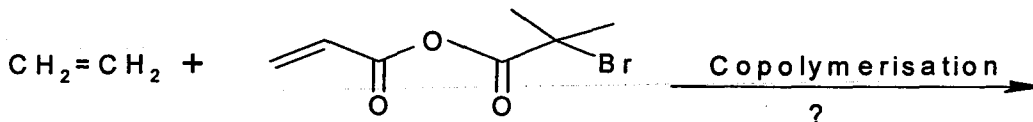


A and B are the two component
L is liquid phase

(b) Classify refractories with examples based on their chemical nature. 4+3 = 7

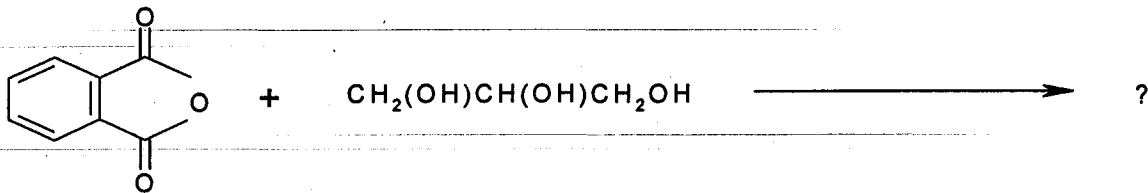
4. (a) What is a ring opening metathesis polymerization (ROMP)? Give a couple of examples including the mechanism of ring opening from one example.

(b) Suggest a catalyst for copolymerization of the following monomers. Comment on the density of the polymer formed.



$$3\frac{1}{2} + 3\frac{1}{2} = 7$$

5. (a) Write the structure of a cross linked polymer formed from the following polymerization reaction.



What is the name of this resin? Write the properties and applications. Give an account on conducting polymer.

(b) Show the constituents of cotton & wool. How do you increase the chemical stability of wool?

Why silk has high tensile strength?

$$3\frac{1}{2} + 3\frac{1}{2} = 7$$

6. (a) What are the number average and weight average of polymers?

(b) Show the structures of a DNA double helix indicating the hydrogen bonds of A-T and G-C.

(c) Outline the structures of the monomers and the product polymers in the following (any three)

Bakelite, Novalak, Buna-S, Neoprene rubber, Epoxyresin, Starch.

$$2+2+3 = 7$$