27 OCT 2017
EASTERN UNIVERSITY, SRI LANKA

Eastern University, Sri Lanka

First Year Second Semester Examination in Science-2013/2014(2016)

CH 105 Introduction to Polymer Chemistry

(Proper and Repeat)

Answer all questions **Time: 01 hour**

a) Explain the following terms with suitable diagrammatic representation.

(i) Three dimensional polymers

(ii) Block co-polymers

(iii) Hetero chain polymers

(iv) Graft co-polymers

(40 marks)

b) Polyurethanes are a common type of elastomeric polymers.

(i) Give the structure of a urethane link found in typical polyurethane and identifies the two components necessary to form a urethane.

(ii) Show, with the aid of curly arrows, how these two components react to form the urethane link.

(iii) Briefly explain why the synthesis of polyurethanes does not fit the definition of step growth polymerisation.

(30 marks)

c) State the main physical properties of an elastomer.

(10 marks)

(d) Briefly discuss each of the following chain polymerisation step, using the free r polymerisation of styrene to illustrate each step.

(i) initiation

(ii) propagation

(iii) termination by disproportionation.

(20 m

2 (a) Explain the following terms to describe a polymer

(i) Atactic

(ii) Isotactic

(iii) Syndiotactic

(30 m

(b) Briefly discuss the key differences between metallocene polymerization and Ziegler-Natta polymerization.

(20 m

(c) (i) Define the term 'degree of polymerization'.

(10 M

(ii) Derive the Carothers equation for the number average degree of polymerizatio step growth polymerization.

(20 M

(d) What is the "glass transition temperature" of a polymer?

(20 m

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