



NATIONAL OPEN UNIVERSITY OF NIGERIA
PLOT 91, CADASTRAL ZONE, NNAMDI AZIKIWE EXPRESSWAY, JABI - ABUJA
FACULTY OF SCIENCES
DEPARTMENT OF PURE AND APPLIED SCIENCE
2021_2 EXAMINATION

COURSE CODE: CHM408

COURSE TITLE: Polymer Chemistry 2

CREDIT: 2 Units

TIME ALLOWED: 2 Hours

INSTRUCTION: Answer Question ONE (1) and any other Three (3) Questions

1a. Using chemical equation, explain the mechanism of free radical polymerization under the followings:

- i. Initiation reaction
- ii. Propagation reaction
- iii. Termination reaction

(8 Marks)

1bi. Write on at least three differences that exist between ionic-initiated polymerization and radical initiated polymerization.

1bii Discuss the thermodynamic of rubber elasticity

(10 Marks)

1c. Discuss on the effect of blending and co-polymerization

(3 Marks)

1d. Explain the effect of additive on mechanical properties of polymers

(4 Marks)

Question 2

2a. Discuss briefly geometrical isomerism.

(6 Marks)

2b. Using structure only, show a tactic polymer, explain a stereospecific reaction

(4 Marks)

2c. Give two examples each of (i) Linear polymers, (ii) Cross linked polymers, (iii) Network polymers (3 Marks)

2d. Explain the polymer behaviour in a good solvent (2 Marks)

Question 3

3a. Explain the benefit of copolymerization. (4 Marks)

3b. Using a representative process define copolymerization (2 Marks)

3c. Mention 4 type of copolymers you know and discuss them using illustration. (9 Marks)

Question 4

4a. Explain vividly

- i. Thermoplastic polymers
- ii. Thermoset polymers (6 Marks)

4b. Write on three differences between high density polyethylene and low density polyethylene. (3 Marks)

4c. Discuss ionizing- radiation degradation (3 Marks)

4d. Establish how “swelling” is arrived at solution process (3 Marks)

Question 5

5a. Define mechanical properties of polymers (2 Marks)

5b. Discuss the various kinds of strength exhibited by polymers. (6 Marks)

5c. Discuss the seven mechanical properties of polymers you know. (7 Marks)