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Polymer Chemistry

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1. Polymers Nomenclature.
2. Polymer Properties (Molecular Weight, Glass Transition Temperature, Crystal Melting Point).
3. Condensation Polymerization (Reaction of condensation polymerization).
4. Addition Polymerization (Free Radical, Cationic, Anionic).
5. Copolymerization (Condensation, Addition).

References:

1. كيمياء الجزيئات الكبيرة ، أ.د. كوركيس عبد ال ادم أ.د. ذنون محمد عزيز
2. Principles of Polymerization , George Odian.

2 Organic Chemistry

أ.د. عباس فاضل عباس

1. Nucleophilicity and Basicity.
2. SN_1 and SN_2
3. E_1 and E_2
4. Aromaticity and Aromatic Substitution Reactions.
5. Neighbouring group participation.
6. Stability of Carbonium ion.
7. stability of carbanion ion.
8. Pyrole.
9. Wolff-Kishner reduction.
10. IUPAC nomenclature of bicyclic compounds.
11. IR spectroscopy of organic compounds.

References:

1. Organic Chemistry- morrison-boyd
2. Mechanism in organic chemistry Peter Sykes.
3. Advance organic chemistry by Cary and Sundberg

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Analytical Chemistry

أ.م.د. أبراهيم محمد جاسم

- 1) Volumetric Analysis
- 2) Gravimetric Analysis
- 3) Instrumental Analysis

References:

4. Modern Chemical Analysis by David Harvey

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Physical Chemistry

أ.د. علي عبدالامام عبدالزهرة

1. First law of the thermodynamic, adiabatic process, the reaction types, enthalpy, Contoured expansion.
2. Thermochemistry, second law of the thermodynamic, entropy,
3. Third law of the thermodynamic, free energy and Chemical equilibrium.
4. Faraday laws, electric conductance, electrolyte theory, ionic activity.
5. Debye-Huckel theory, electrochemical cells, electrode types, reversal cells, electrode potential, e.m.f., electrochemical cells types.
6. The rate of the reaction, chemical reactions types, first order reaction, temperature effect, Fast interactions, Heterogeneous gas reactions.
7. Spectrum in the microwave region, IR spectrum, UV-VIS spectrum, ESR, NMR.

References:

1. الكيمياء الفيزيائية د. علي عبد الحسين سعيد، د. صفاء صالح العمر، جامعه البصره، 1986
2. الكيمياء الفيزيائية الأساس النظرية والتطبيقات، د. انيس عبد الوهاب النجار
3. الديناميك الكيميائي والكيمياء الضوئية، د. جلال محمد صالح، د. باسل هاشم الصدر، جامعه بغداد، 1980
4. Atkins, P.W. Physical chemistry.

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Inorganic Chemistry

أ.د. فارس عبدالرضا جاسم

Organometallic compounds of s- and p-block elements

1. Introduction

2. Group 1: alkali metal organometallics

3. Group 2 organometallics

Beryllium

Magnesium

Calcium, strontium and barium

4. Group 13

Boron

Aluminium

Gallium, indium and thallium

5. Group 14

Silicon

Germanium

Tin

Lead

Coparallel and tilted C₅-rings in group 14 metallocenes

6. Group 15

Bonding aspects and E=E bond formation

Arsenic, antimony and bismuth

7. Group 16

Selenium and tellurium

Organometallic compounds of d-block elements

1. Introduction

2. Common types of ligand: bonding and spectroscopy

ρ -Bonded alkyl, aryl and related ligands

Carbonyl ligands

Hydride ligands

Phosphane and related ligands

π -Bonded organic ligands

Nitrogen monoxide

Dinitrogen

Dihydrogen

3. The 18-electron rule

4. Metal carbonyls: synthesis, physical properties and structure

Synthesis and physical properties

Structures

5. Types of organometallic reactions

Substitution of CO ligands

Oxidative addition

Alkyl and hydrogen migrations

β -Hydrogen elimination

α -Hydrogen abstraction

6. Metal carbonyls: selected reactions

7. Metal carbonyl hydrides and halides

8. Alkyl, aryl, alkene and alkyne complexes

σ -Bonded alkyl and aryl ligands

Alkene ligands

Alkyne ligands

Allyl and buta-1,3-diene complexes

Allyl and related ligands

Buta-1,3-diene and related ligands

Reference

Inorganic chemistry by CATHERINE E. HOUSECROFT

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Biochemistry

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- 1- Carbohydrate: Definition, classification, reaction of carbohydrate and metabolism.
- 2- Lipids: Definition, classification, reaction of lipids and metabolism.
- 3- Amino acids and Proteins: Definition, classification, reactions, structural system of proteins and metabolism.

References :

- 1-Harpers-Illustrated Biochemistry 28th edition
2. Lehninger Principles of Biochemistry 6th edition

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3-الكيمياء الحيوية د. قيس عطوان و د. عيسى عبد عبد الحسن (موجود بالمجانبة)

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