Wizyta profesora Michala Bratyczaka
(Politechnika Lwowska, Ukraina)

Charakter wizyty: profesor wizytujący (*visiting profesor*, okres 23.04–14.05.2017)

Program pobytu:

wykłady: (*15 hours*) **Monomers from petroleum fractions for the polymerization and polycondensation processes**

Program wykładów:

Nowadays petroleum fractions are among the main raw materials for the production of organic compounds, including monomers. Thermal cracking (pyrolysis) of petroleum fractions are used to produce ethylene, propylene, butenes and butadiene. Apart from gaseous pyrolysis products benzene, toluene, styrene and other compounds are obtained.

The pyrolysis Rice-mechanism, process conditions, flow chart and scheme of pyrogas separation will be examined. The pyrolysis fraction C_8-C_9, which is the raw material to produce the so-called petroleum resins, will be examined separately. The petroleum resins, including resins with different functional groups, the production of which is developed at Lviv Polytechnic National University under the direction of Prof. Michael Bratychak will be discussed.

Catalytic reforming is the process for aromatic hydrocarbons production from petroleum fractions. The process conditions, hydrocarbons chemical conversion into aromatic compounds and flow chart of aromatics separation will be examined. The following themes will be discussed as well: styrene as a raw material to produce polymers and rubbers; styrene production from petroleum fraction via ethylbenzene production; styrene production from ethylbenzene; production of vinyl chloride, vinyl acetate, acrylonitrile, methacrylic acid, maleic anhydride, phenol, dioxydiphenyl propane, adipic and terphthalic acids from petroleum fractions. The researches of scientists from Lviv Polytechnic concerning the production of oligomers with peroxy, carboxy, hydroxy and methacrylic groups based on epoxy and phenol-formaldehyde resins will be of special attention.

Wyklady:

Lection 1. Methods of primary petroleum products obtaining.

Lection 2. Wastes of hydrocarbon pyrolysis used as raw materiasl to produce petroleum resins. Lection 3. Production of monomers for polymerization from crude oil fractions. Styrene and ethylene.

Lection 4. Production of monomers for polymerization from crude oil fractions. Vinyl chloride, vinyl acetate, acrylonitrile, acrylic and methacrylic acids, methylacrylate and maleic anhydride. Lection 5. Production of monomers for polycondensation from crude oil fractions. Phenol, dioxydiphenylpropane and adipic acid.

Lection 6. Chemical modification of epoxy resins by hydroperoxides, dibasic and unsaturated acids and glycols.

Lection 7. Chemical modification of phenol-formaldehyde resins by hydroperoxides and peroxides.

Harmonogram wykładu:

Termin	**Dzień tygodnia**	**Godzina**	**Miejsce**
24.04.2017	**Poniedziałek**	**8.15 – 10.00**	**sala 222 (Chemia A)**
25.04.2017	**Wtorek**	**13.15 – 15.00**	**sala 222 (Chemia A)**

26.04.2017	**Środa**	**13.15 – 15.00**	**sala 013 (Chemia C)**
27.04.2017	**Czwartek**	**7.15 – 9.00**	**sala 222 (Chemia A)**
28.04.2017	**Piątek**	**8.15 – 10.00**	**sala 215 (Chemia A)**
08.05.2017	**Poniedziałek**	**8.15 – 10.00**	**sala 222 (Chemia A)**
09.05.2017	**Wtorek**	**13.15 – 15.00**	**sala 222 (Chemia A)**
10.05.2017	**Środa**	**13.15 – 15.00**	**sala 013 (Chemia C)**

Seminars: (*30 hours*) Katedra Technologii Polimerów

Synthesis, properties and application of functional oligomers

Seminar 1: Synthesis of petroleum resins with epoxy groups based on C_8-C_9 pyrolysis fraction in the presence of azocompounds
Seminar 2: Synthesis of petroleum resins with epoxy groups based on C_8-C_9 pyrolysis fraction in the presence of functional oligomers
Seminar 3: Petroleum resins with carboxy groups
Seminar 4: Petroleum resins with hydroxy groups
Seminar 5: Properties and application of petroleum resins
Seminar 6: Bitumen-polymeric mixtures involving petroleum resins
Seminar 7: Chemical modification of epoxy resins by hydroperoxides. Effect of catalyst nature on the structure of modified epoxide
Seminar 8: Modification of epoxy resins by hydroperoxides in the presence of quaternary ammonium salts as a catalyst. The process mechanism
Seminar 9: Modification of epoxy resins by hydroperoxides in the presence of Crown-ethers. The process mechanism
Seminar 10: Oligomers with unsaturated double bonds based on epoxy resins
Seminar 11: Oligomers with carboxy groups based on epoxy resins
Seminar 12: Oligomers with primary hydroxy groups based on epoxy resins
Seminar 13: Application of functional oligomers based on epoxy resins during epoxy-oligoesteric mixtures formation. The process chemistry
Seminar 14: Functional oligomers based on epoxy resins as the components of bitumen-polymeric mixtures
Seminar 15: Synthesis and application of modified phenol-formaldehyde resins

Konsultacje: Katedra Technologii Polimerów (15 godzin)
Godziny konsultacji
Tematy konsultacji:

- proposition with regard to new joint scientific projects
- propositions with regard to new fundamental and original research works
- estimation of scientific works at different stages of their preparing
- estimation of possible application of various investigation methods during conducting scientific projects and works
- assistance for establishing contacts with various scientific-research centers
- preparing joint scientific publications and reports for international conferences
- participation in preparing joint scientific projects involving scientific researches from Gdansk Polytechnic University
- assistance for establishing contacts with other Ukrainian scientific-research organizations

Dodatkowa działalność:

– udział w badaniach
– przygotowanie wspólnych publikacji