CATALYSTS BASED ON ORGANIC POLYMERS IN PETROCHEMICAL PROCESSES

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Organic Cross-linked Polymer Catalysts (OCPC's) are described and compared with catalysts based on inorganic supports. Ways of preparation OCPC's, stressing potentialities for acid, redox and multifunctional catalysis and short case studies devoted to the production of methyl-tert-butyl ether, Bisphenol A, removal of oxygen from water, and one step synthesis of methylisobutyl ketone are presented. A special chapter deals with methods for physicochemical characterisation, in which both literature information and experience of authors are discussed. Necessity of understanding differences in properties of OCPC's and inorganic catalysts, especially ways of catalysts deactivation is underlined as a key for wider exploitation of OCPC's.

Key words: functionalised synthetic resins, acid and redox catalysis, effectiveness, lifetime, deactivation

HYDROREFINING OF KEROSENE FROM HYDROCRACKING OF VACUUM RESIDUES

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Catalytic hydrorefining of kerosene from the hydrocracking of vacuum residue was tested over commercial Co-Mo catalyst as a method for the improving of its color stability. The sample of kerosene from pilot-plant experiment of the hydrocracking of vacuum residue from Slovnaft refinery, having after several month of aging red-brown color, was mixed with primary atmospheric gas oil in volume ratio of 1:6. The mixture, still having red color, was hydrorefined in a laboratory flow pressure reactor under reaction conditions, used for the hydrorefining of pure AGO. The achieved color stability of refined mixture after about 95% desulfurization and 35-40% denitrogenation was as good as those of refined pure AGO.

Key Words: hydrorefining, color stability, kerosene, nitrogen compounds, residue hydrocracking

CATALYTIC ENNOBLING OF FUEL FRACTIONS AND PRODUCTS OF CRUDE OIL OZONOLYSIS CARRIED OUT ON ZEOLITE-CONTAINING CATALYSTS

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A zeolite-containing catalyst, used to refine a gasoline fraction of ozonized oils, improves qualitative and quantitative properties of the obtained gasolines. One can observe a substantial yield of these gasolines as compared with a similar refining of a corresponding fraction of crude oils. The content of aromatic hydrocarbons decreases, while that of iso-alkanes increases. Using selective dewaxing of a diesel fraction of the initiated cracking on a zeolite-containing catalyst obtained were diesel fuels with a high yield. The fuels obtained showed an increased cetane number and had a lower content of aromatic hydrocarbons and sulphur.

Key words: zeolite-containing, catalysts, ozonolysis, oil, yield, activity, conversion, dewaxing

EFFECTS OF INTRODUCTION OF MAG-O, AN ADDITIVE WITH HIGH ZMS-5 CONTENT, ON FCC OLEFIN YIELDS AND GASOLINE COMPOSITION

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After gradually phasing out the lead from gasoline, MOL the Hungarian Oil and Gas Co. was forced to find new high-octane components in the existing manufacturing facilities. Due to MOL's experience in ZSM-5 technology a new olefin experience with the MAG-O catalyst is presented. The especially robust additive catalyst performance can be beneficial especially for these refineries downstream MTBE and Alkylation Units to the FCC Unit.

Key words: fluid catalytic cracking, ZSM-5 zeolite, olefin ± farming additive, octane - mass

DIELECTRIC SPECTROSCOPY OF ASPHALT

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In recent decades considerable research has been dedicated to investigating the chemistry and structure of asphalts. The behavior of asphalt exposed to a changing electrical field based on the measurement of a complex dielectric constant and the testing apparatus is described in this paper. The apparatus for the measurement of the complex dielectric constant of asphalts in the frequency range of 0.0001 Hz and 100 kHz and in the temperature range from ±1008C to about 60 8C was developed. The dielectric properties of several regular and modified asphalts have been measured and successfully modeled. It is expected that using this method in connection with the dynamic mechanical analysis will allow more insight into asphalt internal structure and help to study some phenomena related to the electrical properties of asphalts.

Key Words: asphalt, dielectric constant, impedance model

PRACTICAL EXPERIENCE WITH DETERMINATION OF THE FRAASS BREAKING POINT OF BITUMENS

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In the report, influence of the individual steps of the sample and bitumen film preparation upon the result of determination is given. For evaluation, distillation bitumen B-100 from Russian commercial crude oil and modified bitumen with SBS rubber were used. The experiments on the breaking point of the B-100 distillation bitumen proved that different sample and bitumen film preparation conditions caused a variation in the value of obtained results. The temperature of the bitumen film preparation on the magnetic stove had a significant impact on determination of the breaking point for the 6% SBS rubber modified bitumen.

Key words: bitumen, Fraass breaking point

INTERACTION BETWEEN RAW MATERIALS DURING COPROCESSING OF COAL WITH PETROLEUM RESIDUE

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Coprocessing experiments were carried out at different reaction conditions using North Bohemian low rank coal and vacuum petroleum residue as raw materials. As reference, similar experiments were performed with coal and petroleum residue alone. An attention was paid to the yields and quality of insoluble organic matter of reaction products especially with the respect to retrogressive reactions. The insoluble organic matter was examined using FTIR spectroscopy and texture analysis.

Key words: coprocessing, coal, petroleum residue, FTIR analysis

EFFECT OF ADDITION OF ASPHALTS FROM DEASPHALTING ON THE PROPERTIES OF ROAD ASPHALT AP 80

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Semi-blown road asphalt samples with penetration of 80-100 unit were prepared by blowing of different feedstocks containg asphalts from propane and butane petroleum residue deasphalting. Influence of the addition of these asphalts on the properties of semi-blown asphalt were studied using determination of standard characteristics, adhesion to aggregates and viscosity. Group composition, elemental composition, relative molecular weight and structural parameters of the asphalts or fractions from their separation were

used for the characterization of the asphalts.

Key words: asphalt, blowing, analysis, deasphalting

OPTIMIZATION AND CONTROL OF COMPLEX SYSTEMS

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The paper presents some new approaches to optimization and control of complex systems. A system which by its structure and complexity assumes some special way of hierarchical arrangement both in control and in command activity will be defined as a complex system. In this multilevel hierarchical system the multiple optimization is decomposed to individual levels. In the paper the principle of hierarchical optimization and its possibility for application to control of complex chemical technological systems will be treated.

Key words: hierarchical optimization, multitayer control, multilevel systems, coordinator