**Block highly porous cellular palladium catalyst in the liquid-phase hydrogenation dibenzalacetone**

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***Keywords: c****eramic high-porous cellular materials (HPSM), alyumozol, metallic palladium, palladium nanoparticles, highly porous cellular palladium catalyst, liquid-phase hydrogenation, dibenzalacetone, IR-spectroscopy, NMR-spectroscopy.*

Highly porous aerated block of the palladium catalyst, modified palladium nanoparticles was prepared. As a carrier for the palladium catalyst a highly porous ceramic honeycomb material, was used alyumozol was an active substrate, and the active catalytic component - the metallic palladium. We discuss the technique of modifying of the palladium catalyst by palladium nanoparticles. Dibenzalacetone hydrogenation process was carriedout on the synthesized catalyst in a temperature-controlled manowetric reactor with a stirrer at various temperatures and changes in the initial hydrogen pressure. It was shown that the cellular highly porous block palladium catalyst, palladium modified by nanoparticles catalyzed the benzalatsetona hydrogenation. IR and PMR spectra confirm the complete hydrogenation of double bounds in dibenzalacetone.

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**Structure-mechanical characteristics of the polyfunctional high-porous block-cellular materials on the baseof the oxide ceramics**

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***Keywords:*** *highly porous block-cellular material, structural and mechanical characteristics, volumetric specific external surface, oxide ceramics.*

The article presents the results of the determination of structural and mechanical characteristics of the block of highly porous cellular materials (HPPCM) on the basis of oxide ceramics (aluminum oxide, magnesium oxide, partially yttrium oxide stabilized zirconium dioxide, alyumomagnezium spinel and high alumina porcelain mass. It is shown that such structural and mechanical characteristics, as external porosity, specific external bulk surface, the average density, mechanical strength, volumetric shrinkage block of highly permeable cellular materials (HPPCM) using slurry-based oxide ceramics are dependent on the cell size of the original polymer polyurethane matrix (PPU), the fractional composition and content of the excipient. For the development of the outer surface of the synthesized HPPCM proposed composite substrate consisting of a mixture of aluminum sol and silica sol.

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**On the question of the interaction of borates with mono- and diethanolamine**

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***Keywords****: phenylboronic acid, monoethanolamine, diethanolamine, boron-nitrogen compound, coordination bond, coordination number, NMR spectroscopy, the chemical shift.*

Functional boron-nitrogen compound containing tetra-coordinate boron atom, can be prepared by the reaction of phenylboronic acids with aminoalcohols. Such compounds are of high practical value as a hydrolytically stable surface modifying of cellulosic materials.NMR spectroscopy studied the reaction products formed in the system: phenylboronic acid – monoethanolamine – water, phenylboronic acid diethanolamine - water in an alkaline medium. When analyzing 11B NMR spectra revealed chemical shifts characteristic of the following compounds. In the aquatic environment: monoethanolamine(N→B)-phenylborat, diethanolamine (N→B) -phenyllborat; when dried to constant weight products formed stable boron-nitrogen compounds with the boron atom tetracoordination including: monoethylamine(N → B) -phenylborat and diethylamine(N → B)-phenylborat.

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**Analysis and comparison of methods for purification of natural gas from the acid components**

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***Keywords:*** *membrane technology, characteristics of membranes, absorption, natural gas, carbon dioxide, hydrogen sulfide, purification, amines, gas separation.*

Purification of natural gas from hydrogen sulfide and carbon dioxide is one of the most pressing problems of nowadays, which has a variety of solutions. The paper presents the analyses and comparison of two methods of natural gas purification – membrane and absorption technologies from acid compounds. The advantages and disadvantages of these processes are compared and discussed, as well as the processes key parameters. Membrane technology is offered as an alternative to absorption using amine water solutions. An original approach to the evaluation and analysis of the required values of membranes separation factor based on the comparison of technologies by energy consumption parameters. At a high content of hydrogen sulfide and carbon dioxide in natural gas the using the contemporary membranes reduces the operating costs for the process of gas purification from acid components significantly.

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**The phenomena of turbulent transfer and the efficiency of the physical coagulation of emulsions in a chaotic Packed layer**

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***Keywords****: emulsion, coagulation, chaotic nozzles, flow structure, transfer efficiency.*

The application of the chaotic packed bed as a physical coalescent emulsion (dispersed phase koalestora). The packed bed can be installed in front of the deposition zone pustotelnyh or thin-sumps and for consolidation of the drops. To calculate the efficiency of the coagulation represented by a mathematical model based on the method of transport numbers of units, the cell model and turbulent migration theory of particles. Given the equation for calculating the coefficients of turbulent velocity drops to transfer the packed bed surface. Expressions for calculating the coagulation zone length and the efficiency of the process. Presented calculations coagulation efficiency results from the length of the packed bed at different Reynolds numbers.

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**Features of the fluidized bed granulation scale-up process under the fundamental structural differences between model and industrial units**

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***Keywords:*** *drying; granulation; scale-up; calculation; fluid bed.*

The scale-up features of the fluid-bed granulation of the aqueous salt solutions, considering fundamental structural differences between industrial and model systems, are reviewed. The criteria of granulation drying process is determined, namely the constancy of the variation interval of the following parameters: spray droplet size, temperature and velocity of the fluidizing agent. In addition, the scale-up boundary condition is formulated- amount of seed material should ensure the location of predetermined sized particles within the working chamber. Being based on the chosen scale-up criteria and boundary condition, the calculation of the basic parameters of the industrial process have been done. Analysis of experimental results shows that the simplified method proposed for calculating the values of main process parameters is fully applicable and can reduce the time required to carry out pre-commissioning procedure.

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**Investigation of rheological properties of multicomponent disperse systems with liquid dispersion medium obtained by the wave technology**

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***Keywords:*** *disperse system, wave technology, viscosity, dispersion, rheological properties.*

The results of the research presented in this article confirm the effectiveness of the use of wave technology in the wide range of applications such as chemical, petrochemical and food industries, pharmacology and so on. The article shows the results of experimental studies of the rheological properties of the liquid disperse systems obtained using wave technology . Along with the previously demonstrated increase of dispersity this article shows the influence of the mode of wave processing on the rheological properties of disperse systems. Samples of liquid disperse systems of the same composition processed in different frequency ranges exhibit thixotropic and rheopexy properties. The interconnection between viscosity and particle size of the dispersed phase was observed in the study of rheological properties and structure of the obtained compositions. The use of wave technology allows to adjust the rheological properties of disperse systems by modifying the mode of wave processing. The results can be of interest for technologies based on the use of emulsions, in terms of control over dispersion and rheological properties of obtained products or semi-finished products.

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