

Вестник МИТХТ

1/2009

февраль

Научно-технический
журналИздается с февраля 2006 г.
Выходит один раз
в два месяцаУчредитель
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Подписано в печать
 19.02.2009 г. Формат 60x90/8.
 Бумага офсетная.
 Гарнитура Times.
 Печать офсетная.
 Уч. изд. листов 4,4.
 Заказ № 32.
 Тираж 500 экз.

Отпечатано с оригинал-макета в
 «ГЕЛИОПРИНТ»

119602, Москва, Ак. Анохина, 38, к. 1

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ABSTRACT

L.Yu. Alikberova. Periodic Law and Periodic system of chemical elements.

The earliar attempts chemical of elements' classifications were usually based on their properties. Since chemical properties are very complex and diverse, so that classifications were unsuccessful. The first step to creation Mendeleev's periodic system for chemical elements became using of related atomic weights.

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A. Yu. Zakgeym. Mendeleev and Borodin.

It is told about friendship of two great Russian and worldwide cultural workers Dmitry I. Mendeleev and Alexander P. Borodin.

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A.A. Ivanova. About some aspects of D.I. Mendeleev's world-outlook.

In this paper, the section "World outlook" of D.I. Mendeleev's book "Cherished Thoughts" is analyzed. It is shown, what, in Mendeleev's opinion, is the connection between philosophy and science, how important the problem was for him.

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S.M. Sukhorukova, A.K. Frolkova, K.K. Necheuhin. D.I. Mendeleev as the founder of socio-ecological-economic approach to development of industry in Russia.

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Dmitri Mendeleev (1834-1907) - is the first scientist-chemist and an economist who identified the entire range of socio-ecological-economic problems of industrial production, identifying ways of their technological and socio-economic solutions. The relevance of his ideas persisted.

V.P. Vislovsky, R.M. Talyshinsky, V.F. Tretyakov, N.A. Frantsuzova, V.E. Shejin. Isobutane dehydrogenation by oxidizing in isobutene on Ni-V-Sb/ γ Al₂O₃ catalytic system.

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Addition of nickel oxide in the V-Sb/ γ Al₂O₃ catalytic system, used in oxidative dehydrogenation of isobutane, significantly increases conversion (from 36 to 42-44%) at isobutene selectivity of 70 %. The developed catalysts consisting of systems V-Sb-O and V-Sb-Ni-O were characterized using XRD, XPS, and H₂-TPR. Formation of the discovered nickel vanadate phase NiV₂O₆ is as a result of free phase VO_x is a more effective catalyst due to increase in the quantity of mobile oxygen lattice. It is suggested that the set of various vanadium surface phases improves activity and selectivity of the new catalytic systems.

Yu.B. Kirillov, N.M. Klimenko. Non-empirical calculations for minimal energetic reaction pathways of hf molecule addition to acetylene and methylacetylene.

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*Potential energy surfaces of gas-phased synchronous addition of HF to acetylene and methylacetylene. A non-empirical Hartree-Fock-Ruthane method (Gaussian-03, G-31++G** basis) with electronic correlation consideration in MP2 approximation (Moeller-Plesset 2nd grade) was used. Reaction heats and activation energies were calculated. Reaction heat of HF addition to acetylene molecule is -19.5 kcal/mol, activation energy is 52.3 kcal/mol. Reaction heats of HF addition to methylacetylene according to Markovnikov's rule and against it comprise -20.7 and -16.1 kcal/mol; activation energies are 48.0 and 53.5 kcal/mol accordingly. It was established that HF addition to methylacetylene molecule with formation of 2-fluoropropene is more energetically advantageous according to Markovnikov's rule kinetically as well as thermodynamically.*

S.A. Makarova, I.S. Levacheva, I.A. Grickova, M.A. Sakvarelydze, A.E. Harlov, S.M. Levachev. Influence of ammonium sulfate on the properties of 2D films, made from polysterol microsphere.

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The influence of ammonium sulfate concentration in aqueous sybfase on the parameters of 2D films was investigated. It was observe that, adding of electrolyte is causing the growth of parameters of isotherm due to gidrophobisacia of microsphere because of changes in double electrical layer.

D.S. Sidorenko, A.V. Vovk, S.A. Kutylev, G.M. Kuzmicheva, A.B. Dubovski. Producing and studying of carbon nanotubes.

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Synthesis parameters of multiwall carbon nanotubes were prepared by catalytic pyrolysis of toluene and isopropyl alcohol under isochome conditions in the presence of nickel oxalate as catalyst were investigated. The synthesis products were analyzed by electron microscopy and x-ray diffraction spectroscopy.

M.K. Zakharov. Energy consumption and energy saving while separation liquid mixtures by distillation methods.

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Presented the new method of calculation of heat consumption while separation binary mixtures by distillation methods. Studied the effect of complexity of separation of binary mixtures on necessary heat consumption while separating them by distillation. It is shown that energy-saving in rectification is increased when increasing the reflux ratio.

G.A. Nosov, professor, M.E. Uvarov, assistant, V.M. Miasoedenkov, associate. Crystallization of substances from admixtures with employment of calorific pumps.

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Feasibility study of the crystallization of substances from admixtures process by the means of a calorific pump with a closed cycle on the working substance is provided in this article. It is shown that the usage of the calorific pump allows decreasing significantly power inputs for realization of this process.

A.A. Smirnykh. Features of construction of a measuring rotation devices cell for measurement viscosity.

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With the purpose of research of the phenomena taking place of the initial stage of process proposed the new original construction of measuring system rotational viscosimetr. The area of possible application modernized viscosimetr devices is expanded.

A.A. Smirnykh. Improvement Gepler viscosimetr for research of the liquids with high optical density and viscosity.

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Addition of Gepler viscosimetr (VN-II) the new original constructive elements allow enlarge the interval of possible application for research of the liquids with high optical density and viscosity. The advanced construction of the device allows to increase accuracy of received results of measurements.

M.A. Polunina, V.A. Tverskoy, N.V. Dorofeeva. Gas separated properties of membranes with diffusive layers from N-alkylated poly(vinyl pyridine) and its complexes with sodium dodecyl sulfate.

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O₂ and N₂ permeability of membranes with diffusive layers from quaternary poly(vinyl pyridine) and its complexes with sodium dodecyl sulfate was studied. The influence of a layer's chemical structure on these gases selectivity separation was shown.

B.V. Pokidko, E.F. Bukanova, I.A. Tutorsky, M.B. Il`ina. Influence of Ca²⁺ on the adsorption of different surfactants in the bentonite-water interface.

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Adsorption of surfactants of different nature on the bentonites/water interface and an influence of Ca²⁺ ions on the adsorption characteristics were investigated. The data obtained from adsorption isotherms were compared with RFA data. It was shown that cationic ABDMAC have a maximal adsorption and vertical orientation to the basal space of montmorillonite. In the case of nonionic oxyethylated alkylphenols molecules intercalate in to the interlayer and form bylayer structure parallel to the surface even at high concentrations. Anionic surfactant did not penetrate into interlayer and situated only on the external surface of bentonites. In the presence of calcium ions adsorption increase which lead to more compact vertical orientation of molecules.

A.N. Trofimov, O.Y. Bryksina, V.M. Komarov, V.S. Kopytin, G.A. Simakova, I.D. Simonov-Emeljanov. Adsorption of epoxy oligomer ED-20 and structure interfacial layer on the glass surface.

84

Adsorption of epoxy oligomer ED-20 on the glass surface have investigated. Comparison experimental and calculated on basis Landau-Lifshits theoretical model results indicated that adsorption in studied system was polymolecular.

S.Y. Stefanovich, V.V. Fomitchyov, V.V. Konovalova, A.V. Mosunov, B.V. Mill. Oscillating, relaxating, and translating mobility of Li⁺ ions in the LiNbGeO₅ monocrystal.

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Dielectric properties of single crystals of LiNbGeO₅, crystallizing in the andalusite (β -Al₂SiO₅) structure, have been studied. Dielectric and conducting properties along the major crystallographic axes were investigated at frequencies from 1 to 1000 kHz and in the range of temperatures between 100 and 600 K. Determined potential barriers between the equilibrium positions of Li⁺ ions are classified as low energy (0.23–0.79 eV, along the a axis) and high energy (0.9–1.90 eV, along the a, b, and c axes). Additional interstitial sites with the distances between them 0.3–0.4 Å have been found along the a axis, while no such sites observed along the b and c axes. Activation energy (E_a) in the direction a is 0.47 eV and $\sigma_a(570\text{ K}) = 2 \cdot 10^{-5} \text{ S/cm}$, which correspond to the super-ionic conductivity.

M.V. Tsygankova, V.I. Bukin, E.I. Lisakova, A.G. Smirnova. The extraction of vanadium from sulfuric solutions by N-(2-hydroxy-5-nonylbenzyl)- $\beta\beta$ -dihydroxyethylamin.

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N-(2-hydroxy-5-nonylbenzyl)- $\beta\beta$ -dihydroxyethylamin is shown to appear the efficient extractant for the extraction of vanadium from the weak acidic solutions. Basic regularities the extraction of vanadium has been investigated. The re-extraction of vanadium from the organic phase by alkali and ammonia solutions has been carried out.

Вестник МИТХТ

Журнал выходит один раз в два месяца и публикует обзоры и статьи по актуальным проблемам химической технологии и смежных наук. Журнал основан в 2006 году. Учредителем журнала является Московская государственная академия тонкой химической технологии им. М.В. Ломоносова (МИТХТ).

Журнал входит в Перечень ведущих рецензируемых научных журналов, в которых должны быть опубликованы основные научные результаты диссертации на соискание ученой степени кандидата наук.

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7. Математическим методам и информационным технологиям в химии и химической технологии
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