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Development of a refined scheme of biostratigraphic subdivision of Jurassic deposits in the eastern part of the North Ustyurt Basin based on plant imprints

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Abstract. This article is devoted to fundamental scientific research on the development of a refined scheme of biostratigraphic subdivision of Jurassic deposits of the Eastern part of the North Ustyurt Basin based on plant imprints.

An analysis of previous studies revealed that the previously developed biostratigraphic scheme only considered the conditions of the study area at the local level or within the oil and gas field. The biostratigraphic scheme used by the researchers was based on stage-by-stage subdivision, which does not comply with international standards, particularly the International Stratigraphic Code. Furthermore, this scheme fails to consider layers, strata, formations, and horizons, which is a significant drawback for obtaining comprehensive information about the study site. Therefore, the authors of the study set the task of further studying and developing a more precise scheme of biostratigraphic subdivision using the example of Jurassic deposits of one of the areas of the Ustyurt oil and gas region, which determines the relevance and scientific novelty of the topic.

As a result of their research, the authors of this article developed, for the first time, a refined biostratigraphic subdivision scheme based on the analysis of a large amount of data from deposits and boreholes associated with plant imprints. The new scheme meets the requirements of the International Stratigraphic Code and the international ESG (Environmental, Social, and Governance) framework. The developed framework was first tested in a study of Jurassic deposits in the eastern part of the North Ustyurt Basin. This solution to the problem is becoming a key tool for evaluating numerous studies on the effective search and exploration of new oil and gas deposits, and it also minimizes material and financial costs during geological exploration, including modeling geological processes.

The integrated application of a refined biostratigraphic subdivision scheme based on international ISO standards (harmonization of requirements) is becoming a factor in the modern level of ESG attractiveness, playing an important role in the competitive market among WTO countries and with the possibility of attracting new investments in the oil and gas industry.

This approach revealed the relationship between international standards and methods used to analyze and model complex geological processes occurring in the Earth's interior, particularly in the study of Jurassic deposits in the eastern part of the North Ustyurt Basin. This approach has improved its attractiveness, bringing the industry closer to the ESG rating concept.

The scientific results of the article are based on the analysis of a large amount of factual material, which reflect the stated goals and objectives of fundamental research.

Key words: *new scheme, biostratigraphic subdivision, Jurassic deposits, eastern part of the North Ustyurt Basin, plant imprints, reservoir, oil, gas, horizon, stage, suite, section, search, exploration, field, well, boundaries, International Stratigraphic Code, International ESG (Environmental, Social, Governance) concept*

For citation: M.Kh. Iskandarov, Sh.A. Umarov, M.T. Khannanov, S.S. Khabibullaev, B.S. Aslanov Razrabotka utochnennoy skhemy biostratigraficheskogo raschleneniya yurskikh otlozheniy Vostochnoy chasti Severo-Ustyurtskoy vpadiny po rastitel'nym otpechatkam [Development of a refined scheme of biostratigraphic subdivision of Jurassic deposits in the eastern part of the North Ustyurt Basin based on plant imprints]. Neftyanaya Provintsiya, No. 1(45), 2026. pp. 1-26. DOI https://doi.org/10.25689/NP.2026.1.1-26. EDN AXKYVH (in Russian)

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EDN NPAREA

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Geochemistry of oils, condensates and gases of the Mesozoic deposits of the Fergana intermountain depression

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Abstract. This article presents the results of a study of the geochemical properties of oils, condensates, and gases in Mesozoic deposits of the Fergana Depression, as well as their petroleum potential. It presents the geochemical and physicochemical characteristics of oils, condensates, and gases from individual fields and exploration areas, and identifies the key patterns of variation in the quality of oils, condensates, and gas composition within the depression, both spatially and within the sedimentary cover of the area.

In response to the recent growing interest of subsoil users in the oil and gas potential of the Mesozoic deposits of the Fergana Depression, this article examines in detail the patterns of change in the qualitative composition of oils (density, viscosity, sulfur, paraffin, resin, asphaltene, and gasoline content) and gases (methane homologues, carbon dioxide, nitrogen, hydrogen sulfide, and helium content) and their prospects. The article presents the results of a comparative analysis of the physicochemical characteristics of oils, condensates, and natural gases. Maps of changes in the physicochemical parameters of oils and gases in the Jurassic and Cretaceous deposits of the depression have been constructed. A forecast of the quality of oils, condensates, and gases in exploration areas is provided, along with a geochemical justification for further geological exploration within the study area.

Key words: *geochemistry, oil, condensate, gas, fluid, deposit, fields, Jurassic, Cretaceous, horizon, methane homologues, Fergana*

For citation: F.F. Zhuraev, T.Kh. Shoimurotov, I.N. Khakimzyanov, F.T. Khalikulova Geokhimiya neftey, kondensatov i gazov mezozoyskikh otlozheniy Ferganskoy mezhgornoy vpadiny [Geochemistry of oils, condensates and gases of the Mesozoic deposits of the Fergana intermountain depression]. Neftyanaya Provintsiya, No. 1(45), 2026. pp. 27-54. DOI https://doi.org/10.25689/NP.2026.1.27-54. EDN NPAREA (in Russian)

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EDN ZPJUJV

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An integrated approach for dual-medium characterization at carbonate field appraisal stage

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Abstract. This paper describes an integrated approach to determining flow and storage properties of naturally fractured reservoirs, applied during the appraisal stage of a gas field in the Surkhandarya region of the Republic of Uzbekistan. Particular attention is given to estimating fracture compressibility, which at the appraisal stage represents one of the most uncertain dual-medium parameters and significantly influences production forecasts, especially for fields with abnormally high initial reservoir pressure. The proposed method is based on integrating the following stages: (1) conducting specialized field studies, including a suite of well logging methods characterizing natural fracture properties, and a special well testing technique – interwell pulse testing; (2) constructing a discrete fracture network model (DFN) and a dual-medium simulation model using the dual-porosity (DP) approach; (3) history matching the hydrodynamic model to pulse test results with quantitative determination of dual-medium parameters: permeability, porosity, and compressibility of both fractures and matrix. The proposed approach enables reduction of uncertainty ranges for properties of fractured reservoirs prior to pilot production, thereby improving the reliability of development forecasts at early stages of field development.

Key words: *naturally fractured reservoir, fracture void compressibility, interference testing, dual porosity, Surkhandarya oil and gas region*

For citation: A.V. Gavrilov, S.E. Togaev, A.G. Klevitskiy Integrirovannyy podkhod k opredeleniyu parametrov dvoynoy sredy na etape razvedki karbonatnogo mestorozhdeniya [An Integrated Approach for Dual-Medium Characterization at Carbonate Field Appraisal Stage]. Neftyanaya Provintsiya, Neftyanaya Provintsiya, No. 1(45), 2026. pp. 55-75. DOI https://doi.org/10.25689/NP.2026.1.55-75. EDN ZPJUJV (in Russian)

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EDN YSMYJB

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Prospects for Jurassic pinch-out zones on the northwestern flank of the West-Siberian Province

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Abstract. The flank zones of the West Siberian Petroleum Province are of great interest for the exploration of large hydrocarbon accumulations. The western flank zone illustrates the geological preconditions for the formation of vast oil and gas accumulation areas. Upward areal sequential stratigraphic pinching-out of promising accumulations contributes to the formation of stratigraphically screened structural traps. Insufficient geological and geophysical knowledge increases the uncertainty in interpreting the locations of areal stratigraphic pinching-out lines, creating significant geological risks during exploration. The authors have built maps of estimated promising zones and traps for seven Jurassic horizons, as well as a summary map of oil and gas potential, which is of particular interest for planning further exploration. Resources have been estimated for promising targets, and a probabilistic resource assessment has been made. Approximately 70% of the total resource potential is concentrated in stratigraphically screened structural traps within the study area.

Key words: *reservoir, trap, accumulation, field, Jurassic reservoirs, structure, stratigraphic pinching-out, geological and geophysical knowledge*

For citation: S.L. Belousov, A.A. Sokolnikova, D.A. Sidorov, A.A. Pankova Perspektivy zon vyklinivaniya yurskikh otlozheniy na severo-zapadnom bortu Zapadno-Sibirskoy pro-vintsii [Prospects for Jurassic pinch-out zones on the northwestern flank of the West-Siberian Province]. Neftyanaya Provintsiya, No. 1(45), 2026. pp. 76-95. DOI https://doi.org/10.25689/NP.2026.1.76-95. EDN YSMYJB (in Russian)

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EDN YRPDZU

УДК 552.54

Features of interpreting the mineral composition of carbonate rocks: using the example of reservoirs in the Yuryakh Formation

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Abstract. In this study, the significance of integrated lithological and mineralogical investigations of carbonate rocks is examined for addressing both scientific and applied problems of geology and hydrocarbon field development. The research focuses on carbonate reservoirs of the Yuryakh Formation (Upper Vendian–Lower Cambrian) within the Nepa-Botuoba petroleum province. In several cases, comparison of analytical data obtained using different methods revealed discrepancies in determining the mineral composition of carbonate rocks. These inconsistencies are attributed to specific features of the dolomite crystal structure. The determined unit-cell parameters indicate the presence of isomorphic substitutions within the dolomite lattice. The identified characteristics must be taken into account when reconstructing depositional environments, analyzing secondary alteration processes, studying the filtration, reservoir and geomechanically properties of carbonate rocks, as well as when planning acid treatments and solving other applied and scientific tasks.

Key words: *Carbonate rocks, carbonate reservoirs, Eastern Siberia, Nepa–Botuoba anteclise, Yuryakh Formation, dolomite, XRD, XRF, SEM, thermal stability, acid resistance*

For citation: O.G. Mikhalkina, D.R. Krayn, R.F. Ilgil'din, I.A. Mosolov,D.A. Pushkareva, T.D. Khabibullin Osobennosti interpretatsii mineralnogo sostava karbonatnykh porod na primere kollektorov yuryakhskoy svity [Features of interpreting the mineral composition of carbonate rocks: using the example of reservoirs in the Yuryakh Formation]. Neftyanaya Provintsiya, No. 1(45), 2026. pp. 96-114. DOI https://doi.org/10.25689/NP.2026.1.96-114. EDN YRPDZU (in Russian)

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EDN VLXZOI

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The experience of identifying types of seismogeological risks and the methodology of their assessment in the design of production drilling in the fields of JSC «Orenburgneft»

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Abstract. The article shows an approach to taking into account the possible risks of not confirming the structural surfaces of target objects during drilling support at the hydrocarbon fields of JSC Orenburgneft. In the absence of the possibility of conducting more precise seismic exploration at the developed fields, the only possible approach is to work with the current materials. Understanding the quality of the initial material and taking into account the risks based on this is crucial when planning the drilling strategy at the field. This approach allows for correct drilling planning in most cases and is cost-effective, as it does not require complex work.

Key words: *types of seismogeological risks, risk assessment methodology for production drilling*

For citation: D.A. Barulin, V.I. Sobolev Opyt vydeleniya tipov seysmogeologicheskikh riskov i metodologiya ikh otsenki pri proyektirovanii eks-pluatatsionnogo bureniya na mestorozhdeniyakh AO «Orenburgneft'» [Experience in identifying types of seismogeological risks and methodology for their assessment when designing production drilling at the fields of Orenburgneft JSC]. Neftyanaya Provintsiya, No. 1(45), 2026. pp. 115-131. DOI https://doi.org/10.25689/NP.2026.1.115-131. EDN VLXZOI (in Russian)

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EDN YSUOER

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Forecast of oil production dynamics based on a probabilistic approach using integral characteristics of oil displacement by water

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Abstract. The model of oil displacement characteristics by water is a fast and effective way to estimate the remaining recoverable reserves. Using this method saves a lot of time, as well as financial costs that are necessary to build a hydrodynamic model. Current research concerns the application of probabilistic forecasting using integral irrigation curves. The proposed method for estimating oil reserves and other indicators has the advantages of the traditional use of displacement characteristics and also provides an opportunity to make a forecast using strictly approved criteria for filtering non-physical extrapolated values, which allows different engineers to obtain the same result with the same input data and use time for its analysis more efficiently.

The article provides a brief overview of domestic methods for predicting the value of recoverable oil reserves using displacement characteristics based on a probabilistic approach. The main attention is paid to the problems related to the reliability of the extrapolated result. A method for predicting the dynamics of oil production using a probabilistic approach based on integral displacement characteristics is considered.

In the course of current research, it has been established that it is necessary to take into account the discrepancy between the latest historical value of oil production dynamics and the first extrapolated indicator. In addition to the convergence criterion at the last historical point, it is necessary to monitor the value of the multiplicity of recoverable oil reserves: if the extrapolated recoverable oil reserves do not lie within the accepted range of the multiplicity of residual recoverable reserves, implausible indicators should be eliminated.

Key words: *integral characteristics of oil displacement by water; water cut curves; probabilistic approach; recoverable oil reserves; forecast; program; distribution function; dynamics of oil production*

For citation: V.S. Shumko Prognoz dinamiki doby`chi nefti na osnove veroyatnostnogo podxoda s ispol`zovaniem integral`ny`x xarakteristik vy`tesneniya nefti vodoj [Forecast of oil production dynamics based on a probabilistic approach using integral characteristics of oil displacement by water]. Neftyanaya Provintsiya, No. 1(45), 2026. pp. 132-145. DOI https://doi.org/10.25689/NP.2026.1.132-145. EDN YSUOER (in Russian)

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EDN EDFFEA

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Using multivariate modeling approach in gas field development project optimization at the example of Megion formation deltaic deposits

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Abstract. The article describes a methodology for interactive new gas field development project optimization based on detailed lithological and seismogeological analysis, stochastic multivariate modeling and adaptation of the horizontal wells drilling scheme to the reservoir geological features complexity. The use of the suggested approach has made it possible to improve the new wells production rates and increase the final gas extraction ratio in relevance to the previously accepted project design document. As the part of optimization task solving, a sedimentological description of the core, a seismic and facies analysis were performed, a detailed correlation of the wells section was carried out, and three variants of the conceptual model corresponding to the quantiles P90, P50, and P10 were substantiated. The subsequent production performance of the designed horizontal wells sensitivity to the gas reservoir features uncertainties analysis allowed us to select from several hundred realizations the most probable and geologically justified hydrodynamic model. The correctness of the chosen reservoir model simulation was verified by production rates assessment.

Key words: *gas field, core, facies, sedimentary rock, seismic attribute, conceptual model, geological model, uncertainty, sensitivity analysis, hydrodynamic model*

For citation: T.E. Topalova, A.E. Popov, A.A. Snokhin, A.V. Kychkin, S.A. Klimov Ispol'zovaniye mnogovariantnogo modelirovaniya dlya optimizatsii proyekta razrabotki gazovoy zalezhi v del'tovykh otlozheniyakh megionskoy svity [Using multivariate modeling approach in gas field development project optimization at the example of Megion formation deltaic deposits]. // Neftyanaya Provintsiya, No. 1(45), 2026. pp. 146-173. DOI https://doi.org/10.25689/NP.2026.1.146-173. EDN EDFFEA (in Russian)

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EDN YFDQQN

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An integrated approach to enhancing the efficiency of oil field development at a late stage (on the example of a field in the Republic of Tatarstan)

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Abstract. Within the petroleum engineering community, there is a prevailing belief that integrated models are primarily valuable for "green" fields and gas fields, where the surface network significantly impacts facility investment and production lift efficiency, respectively. In this paper, the authors demonstrate the practical value of using integrated modeling for mature fields with existing infrastructure. The article addresses the challenge of planning well interventions (workovers) at a late stage of development for such an oil field. Using an example from a field in the Republic of Tatarstan, characterized by high water cut and technical constraints in the reservoir pressure maintenance system, it is shown that traditional geological and reservoir simulation models do not account for the impact of surface infrastructure and well equipment. The authors propose an integrated approach utilizing Integrated Asset Modeling (IAM), which combines reservoir, well, and surface network models. It is proven that the application of IAM not only improves the accuracy of production rate forecasts but also reveals hidden effects (wellhead interference, capacity constraints) that influence the ultimate economic efficiency of the project. The research findings can be applied to fields with similar geological and engineering conditions.

Key words: *integrated modeling, geological and technical operations, late development stage, wellhead interference, RPM system, hydrodynamic model, optimization of ground-based infrastructure, polymer flooding*

For citation: D.A. Proshletsov, Sh.M. Akhunov, V.S. Makarov, T.R. Zainagutdinov, R.R. Timerbaev Kompleksnyy podkhod k povysheniyu effektivnosti razrabotki neftyanogo mestorozhdeniya na pozdney stadii (na primere mestorozhdeniya Respubliki Tatarstan) [An integrated approach to enhancing the efficiency of oil field development at a late stage (on the example of a field in the Republic of Tatarstan)]. Neftyanaya Provintsiya, No. 1(45), 2026. pp. 173-188. DOI https://doi.org/10.25689/NP.2026.1.173-188. EDN YFDQQN (in Russian)

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Consideration of layered reservoir heterogeneity in the hydrodynamic model due to modification of relative phase permeability

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Abstract. This article analyzes the impact of neglecting geological heterogeneities on the history matching accuracy of a hydrodynamic model, which is particularly relevant in conditions of high uncertainty in reservoir properties in the interwellbore space. The objective of the study is to identify patterns in relative permeability changes when accounting for layer-by-layer heterogeneity during the history matching process. Numerical modeling methods based on real field data were used. The results demonstrate improved convergence between calculated and actual data by adjusting relative permeability.

Key words: *hydrodynamic modeling, adaptation, relative phase permeability, geological heterogeneity, layered heterogeneity*

For citation: N.R. Gazizov. Uchet sloistoy neodnorodnosti kollektora v gidrodinamiche-skoy modeli za schet modifikatsii otnositel'nykh fazovykh pronitsayemostey [Consideration of layered reservoir heterogeneity in the hydrodynamic model due to modification of relative phase permeability]. Neftyanaya Provintsiya, No. 1(45), 2026. pp. 189-207. DOI https://doi.org/10.25689/NP.2026.1.189-207. EDN SSTQNI (in Russian)

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EDN LWJCLX

УДК 622.276.63

Повышение эффективности кислотного воздействия на терригенные заглинизированные коллектора

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Abstract. The main share of hard-to-recover oil reserves are concentrated in reservoirs that have low permeability and are characterized by high micro- and macro-heterogeneity, a complex pore space structure, and reduced values of filtrations speed and reservoir properties.

Increasing the efficiency of methods of influencing low-permeability clay-filled reservoirs is based on a systematic analysis of the results of using declaying technologies, since such objects are extremely sensitive to the parameters of the technologies used. The solution of this problem is based on studying influence of pre-grouped “reservoir types” to dynamics of the injectivity before and after acid treatments.

***Key words**: injection well, reservoir treatment, clayey reservoir, permeability, injectivity, acid composition*

For citation: Nasybullin I.S. Povysheniye effektivnosti kislotnogo vozdeystviya na terrigennyye zaglinizirovannyye kollektora [Increasing the efficiency of acid treatment on terrigenous clayey reservoirs]. Neftyanaya Provintsiya, No. 1(45), 2026. pp. 208-218. DOI https://doi.org/10.25689/NP.2026.1.208-218. EDN LWJCLX (in Russian)

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EDN ISRGEO

УДК 622.276.63

Improvement of well acidizing efficiency in carbonate and terrigenous reservoirs

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Abstract. The research performed has resulted in the development of a specific algorithm to select acid systems for well treatment operations in carbonate and terrigenous reservoirs. This analytical study is based on analyzing the effect of physical and chemical characteristics of acid systems on treatment efficiency in carbonate and terrigenous reservoirs when used for injection and production well stimulation. To enhance the efficiency of well acidizing in carbonate and terrigenous reservoirs, a new approach to selecting acid systems is considered. This approach includes determination of technical and operational parameters related to the mineralogical features of reservoirs and physical-chemical properties of oil. A number of methods and key parameters are used to develop new technologies and acid systems, as well as to adjust the existing ones to specific reservoir conditions. These methods can be classified as general and specialized. General methods include standard procedures to determine physical and chemical properties, such as appearance, density and concentration of the basic component, interfacial tension (IFT), dissolution rate of St.3 steel, and freezing point. Specialized methods are focused on studying the interaction between acids and the reservoir rock, for example, solubility of core samples or individual minerals (such as marble, quartz, etc.). These methods also involve studying interaction between acids and reservoir fluids, including compatibility with oil and formation water, as well as permeability tests using models and core samples. Solution to this problem is based on theoretical and experimental studies supported by preliminary review of domestic and foreign experience using public sources. The results of experimental studies were processed by analytical methods. This paper presents justification of the key standard parameters and their values used in technical and process requirements and conditions applied to acid systems for well acidizing operations in carbonate and terrigenous reservoirs. This includes determination of their significance, reviewing domestic and foreign research experience, description of procedures, determination of basic requirements for acid systems to ensure their efficiency during well acidizing operations in carbonate and terrigenous reservoirs, definition of key techniques and parameters to assess the efficiency of well acidizing, as well as justification of selection and significance of physical and chemical characteristics and their values.

Key words: *acid system, acidizing, wellbore zone, carbonate and terrigenous reservoirs, physical and chemical characteristics, optimum values*

For citation: N.I. Baturin, R.R. Stepanova, I.G. Fattakhov Povysheniye effektivnosti kislotnykh obrabotok priskvazhinnykh zon karbonatnykh i terrigennykh kollektorov [Improvement of well acidizing efficiency in carbonate and terrigenous reservoirs]. Neftyanaya Provintsiya, Neftyanaya Provintsiya, No. 1(45), 2026. pp. 219-250. DOI https://doi.org/10.25689/NP.2026.1.219-250. EDN ISRGEO (in Russian)

DOI: https://doi.org/10.25689/NP.2026.1.251-262

EDN HDJOJK

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Formulation of multipurpose oil-free hydrophobic emulsion composition

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Abstract. The study is concerned with the composition of oil-free hydrophobic emulsion designed for multiple purposes, particularly for well stimulation**.** The study is aimed at formulation of oil-free hydrophobic emulsion composition with desired physical and chemical, rheological, structural-mechanical, and process parameters and properties required for diversion of acid compositions during matrix, selective and deep-penetrating acid treatments of near-wellbore zones in carbonate reservoirs. The authors review microscopic studies of oil-free hydrophobic emulsions with concentration of dispersed phase of 80% and higher based on state-of-the-art emulsifiers (hydrocarbon surfactant solutions). Analysis of recent Russian and foreign literature on formulation of hydrophobic emulsions for well stimulation and improved oil recovery applications suggests the current importance of intended studies and highlights the current trend towards enhanced use of chemicals for stimulation of oil production wells and complex, heterogeneous carbonate reservoirs. Furthermore, absence of crude oil in the hydrophobic emulsion composition is very beneficial in that it provides reduction of labor, economic and material costs due to optimization of repeated treatments of near wellbore zones in carbonate reservoirs and killing of difficult wells.

Keywords*: carbonate reservoir, hydrophobic emulsion, diverter, emulsifier, oil-free base, basic formulation, dynamic viscosity, shear rate, structural and mechanical properties*

For citation: M.Kh. Musabirov, A.Y. Dmitrieva, N.I. Baturin, I.G. Fattakhov Razrabotka sostava gidrofobnoy emul'sii na bezneftyanoy osnove mnogotselevogo naznacheniya [Formulation of multipurpose oil-free hydrophobic emulsion composition]. Neftyanaya Provintsiya, Neftyanaya Provintsiya, No. 1(45), 2026. pp. 251-262. DOI https://doi.org/10.25689/NP.2026.1.251-262. EDN HDJOJK (in Russian)

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In-situ transformation of transformation of high-viscosity oil in the presence of metal tallates under hydrothermal conditions

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Abstract. This paper examines the composition and structure of high-viscosity oil formed in situ from an oil-soluble iron- and cobalt-based precursor under hydrothermal conditions. It was found that resins and asphaltenes are destroyed by transition metal catalysts. Experiments were conducted using oil-soluble iron and cobalt carboxylates in the presence of a hydrogen donor. The use of catalyst precursors was found to affect the gas composition of the aquathermolysis products, their rheological properties, and their component composition. Thermal catalytic action with the addition of cobalt tallate resulted in a 2.5-fold decrease in viscosity at 150°C and a 1.5-fold decrease at 200°C. A similar 1.5-fold decrease was also observed with an iron-based catalyst precursor.

Key words: *heavy oil, catalyst precursor, metal tallates, resin-asphaltene substances, catalytic activity, hydrothermal conditions, component composition*

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Physical and mathematical modeling of turbulent fluid flow in an inflow control device as a key component of an intelligent well completion system

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Abstract. Solving the problem of premature flooding of wells with extended horizontal completions remains a pressing issue, and improving the efficiency of hydrocarbon production from such wells through the application of Inflow Control Devices (ICDs) is limited, among other factors, by sanctions and the high cost of foreign solutions. The development of domestic analogues, which take into account the known shortcomings of foreign devices and possess a number of advantages—such as the ability to assess the composition of the incoming fluid in a wellbore segment—will ensure long-term production from horizontal wells and promote the wider application of ICDs. The paper addresses issues of physical and mathematical simulation of turbulent fluid flow in one of the elements of lower well completion, investigating the influence of key fluid motion parameters within the throttle package of the developed original ICD using the COMSOL software.

Key words: *Inflow Control Device (ICD), intelligent well completion, physical and mathematical modeling, turbulent flow, two-phase mixture (multiphase flow), digital twin of the device, throttle package*

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The role of professor V.I. Troepolsky in petrophysical support for oil exploration

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Abstract. It is shown that Viktor Ivanovich Troepolsky (1905–1989), a prominent representative of the Kazan Geological School and professor at Kazan University who headed the Department of Oil and Gas Geology for over 25 years, should be considered the founder of the scientific field of studying the reservoir properties of oil-producing deposits in the Volga-Ural region. He made significant contributions to understanding the capacitive properties and reservoir characteristics of oil- and bitumen-saturated rocks during the development of Tatarstan's largest fields and developed unique methods and techniques for assessing the reservoir properties of key productive horizons, including reservoirs with complex structures.

Key words: *Outstanding scientist and organizer, Tatneftegazrazvedka Trust, Kazan University, founder and head of the department, oil field, lithological and reservoir characteristics, Troepolsky method, classification of voids in carbonate rocks, method for assessing cavernosity, methodology for assessing the reservoir properties of sands and weakly cemented sandstones*

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