

# Summaries

UDC 561.4(571.16)

**Rychkova I.V.**  
**GYMNOSPERMAE PLANTS OF PALEOCENE-EOCENE  
IN SOUTH-EAST OF WESTERN SIBERIA**

Gymnospermae plants imprints found out for the first time from deposits of paleocene-eocene in the southeast of Western Siberia (Tomsk region) have been studied. The full systematics of gymnospermae plants is introduced. It was shown that a new location complements our knowledge about Flora evolution in paleocene-eocene ages, serves as an index of certain paleo-landscape environments and climate as well as supports the search of new coal deposits in south-east of Western Siberia.

UDC 553.242.4:544.034.2

**Kucherenko I.V.**  
**EMPIRIC EVIDENCES OF CONCENTRATION-DIFFUSION  
MECHANISM OF MASS TRANSFER IN NEAR-FRACTURE  
HYDROTHERMAL METASOMATISM PROCESSES**

The empiric data proving concentration-diffusion mechanism of mass transfer in near-fracture hydrothermal metasomatism process have been obtained for the first time. In differential on chemical composition the archean ultrametamorphic substratum from the near-ore metasomatites (beresites) of Irokindinskoe gold deposit formed due to the initial rocks with high content petrogenic elements (Si, Al, Ca, C<sub>org</sub> and others) are moved to the rocks with their low content. It confirms the experiment and theoretical calculation results.

UDC 553.495+553.493.5

**Potseluev A.A.**  
**CARBONACEOUS SUBSTANCES IN HYDROTHERMAL  
URANIUM AND RARE-METAL DEPOSITIONS**

It was shown that solid carbonaceous substances (graphite, amorphous carbon, anthraxolite, kerite) and hydrocarbons in gases (from methane to hexane) of fluid inclusion are widely spread in ores of uranium and rare-metal depositions. Isotopic-geochemical and mineralogical data indicate their formation in a uniform process with the main ore mineralization from a uniform metalliferous fluid forming their zonation.

UDC 553.3/.4

**Ananyev Yu.S., Potseluev A.A., Zhitkov V.G.,  
Nazarov V.N., Kuznetsov A.S.**  
**COSMIC STRUCTURE MODEL OF ZYRYANOVSK  
ORE REGION (RUDNY ALTAY)**

Cosmic structures of Zyryanovsk ore region (Rudny Altay) have been studied by the materials of multispectral space systems Landsat ETM+, IRS and radar mapping SRTM. It was shown that Zyryanovsk ore region is divided by large lineations into blocks with different geological structure. In south part of the area four focal structures are selected. Laws of ore objects location in linear, ring and focal structures were determined. The set of the ascertained laws allows considering them as prognostic-search criteria of areas perspective for ascertaining polymetallic mineralization of the rank ore cluster – ore field.

UDC 55(1/9):552.1

**Korobeinikov A.F., Gusev A.I., Rusanov G.G.**  
**PETROLOGY AND GOLD MINERALIZATION  
OF KALBA ADAKITE GRANITOIDS**

The substantiation of assigning acid varieties of Kalba kunushskiy complex (Kazakhstan) to high-silicon adakite granitoids has been introduced for the first time. The combined model of forming adakite granitoids of the region as a result of melting the subducting slab, in which the transfer form the process of slab dehydration to partial mel-

ting and significant role of metasomatizing fluids of mantle cline was noticed, was proposed. High gold mineralization of the complex as the whole and especially the dykes of final interstitial phases was shown.

UDC 551.793+551.893

**Rusanov G.G.**  
**ON THE FEATURES OF STRUCTURE AND CONDITIONS OF  
FORMING QUATERNARY DEPOSITS OF KUBARDU SECTION**

Brief review of Kubardu section state of exploration has been given. Late-Pleistocene age of deposits building up this section and ability of their dissection into three horizons or depths differing in lithology, genesis, age, condition of forming is substantiated. Lower depth is the alluvium of the second (Kargin) Late-Pleistocene interglacial period, middle – drift deposits of the beginning of the last (Sartan) glaciation and upper – deposits of last-morainic complex of its degradation age. This section may be a key one for interglacial-glacial deposits of the second half of upper Neopleistocene.

UDC 553.97:631.423.3(571.16)

**Preis Yu.I., Bobrov V.A., Budashkina V.V., Gavshin V.M.**  
**EVALUATION OF MINERAL SUBSTANCE STREAM  
BY PROPERTIES OF PEAT DEPOSIT OF BAKCHAR BOD  
(SOUTHERN TAIGA OF WESTERN SIBERIA)**

The detailed complex investigations and dating by <sup>210</sup>Pb, <sup>137</sup>Cs and <sup>14</sup>C of peat of bod allowed evaluating the flows of substance from atmosphere for the last 3000 years and determining stop of peat accumulation and loss of paleoaerosols in periods of Holocene dry cooling about 580 and 2980 years ago.

UDC 550.834.05(571.56)

**Abrosimova O.O., Kulagin S.I.**  
**FEATURES OF THE STRUCTURE OF CAMBRIAN  
COMPLEX DEPOSITS WITHIN MIRNINSK STEP  
(NEPA-BOTUOBA ANTECLISE)**

Mirninsk step distinguishes itself by the most active magmatism within the Nepa-Botuoba antecline. The blow holes of Devonian age as well as numerous dykes and sills of gabbro-dolerites are known here. The majority of dykes by the drilling and gravity and magnetic data has north-north-east extension forming Vilyuisk-Markhinskiy dyke system. Determination of trap-saturation of sedimentary cover and intrusive body position relative to oil and gas plays forms first of all the basis of evaluation of trappean magnetism influence on oil and gas content. Presence of salt rock beds of considerable power in lower Cambrian section predetermines the occurrence of salt tectogenesis capable of deforming considerably the power of certain stratigraphic divisions. The reef-like structures which may serve as traps of hydrocarbons may be formed in carbonate deposits of Cambrian age. Seismic material of high ratio together with drilling data allowed specifying geological structure of the studied area.

UDC 552.578

**Beizel A.L.**  
**THE MODEL OF FORMING OIL AND GAS RESERVOIR  
ON THE BASIS OF GEOGRAPHICAL CYCLE CONCEPT**

The formation of oil and gas reservoir is introduced as production of sedimentary cycle consisting of a sand permeable part and shale baffle. The known geographical cycle concept which is also applied to marine basin area forms the basis of the model. In continental facies the geographical cycle is represented by pro-cyclite which is transformed into marine recyclite owing to the action of shore barrier region. In this case, a sand layer carries out a diagonal transfer from the lower basal position to the upper regressive one. As a result the sand continental beds are assigned clayed marine ones and the clayed continental – sand marine.

UDC 552.578.2.061.42:551.72(571.5)

**Fomin A.M., Dankina T.A.**  
**DISTRIBUTION OF RESERVOIRS IN OIL AND GAS HORIZONS IN NORTH-EAST PART OF NEPA-BOTUOBA ANTECLISE**

The data on paleogeography, lithology and reservoir properties of the principle oil and gas horizons of terrigenous vend in north-east of Nepa-Botuoba antecline have been introduced. The conclusions were drawn on the conditions of their sedimentation and postsedimentation rock changes.

UDC 551.8:551.762.22(571.122)

**Vakulenko L.G., Yan P.A.**  
**SEDIMENTOGENESIS OF OIL-BEARING  $Y_u_2$  HORIZON AND ITS VALUE AT HYDROCARBON ACCUMULATION SEARCH AND EXPLORATION**

Middle-Late Bathonian oil-bearing  $Y_u_2$  horizon in the central part of the Western Siberia has been studied by integrated sedimentological methods. The study showed that the complex structure of the horizon is caused by the variety of sedimentary environments. The lowermost part of the  $Y_u_2$  horizon is presented everywhere by the terrestrial beds. Upwards these beds they are changed by deltaic or coastal deposits and upper – by shallow-marine ones. The ratio of continental, intermediate and marine deposits of the  $Y_u_2$  horizon sections changes depending on its paleohypsometrical location. The dependence of deposits porosity and permeability on environments of their sedimentation was analyzed. The results of the research allow predicting three-dimensional reservoir rock distribution.

UDC 551.86(571.122)

**Popov A.Yu., Kazanenko V.A.**  
**FEATURES OF BATHONIAN SEDIMENTOGENESIS IN NORTH-EAST OF SHIROTNOE PRIOBE**

The transgressive character of oil-and-gas bearing horizon  $Y_u_2$  (Middle-Upper Bathonian) in the north-east of the Shirotnoe Priobie has been determined on the basis of lithofacial analysis. At the initial continental stage a marsh-lacustrine-alluvial lower plain with shallow meandering rivers existed. The approach of the sea from the north led to the accumulation of the transitive complex deposits with gradual promotion of the coastal line to the south. At the final stage of horizon forming the coastal-marine environments prevailed. On the slopes of the Surgutskaja and Nizhnevartovskaja structure the coastal-continental environments prevailed. It was revealed that potential collectors were connected with the bodies formed in conditions of meander bars, fluvial deltaic branches, barrier bars, and bars of shallow water.

UDC 553:551.862(571.16)

**Chernova O.S.**  
**THE PALAEOGEOGRAPHIC CONDITIONS OF THE FORMATION OF THE UPPER JURASSIC SEDIMENTS OF UST'-TYM DEPRESSION (TOMSK REGION)**

In the article the result of the specialized sedimentological researches of deposits of upper Jurassic productive horizon Ust'-Tym depression is described. As a result of the detailed core study and the applications of the electrometric methodology of the cross-section the lithofacies maps with the elements the electrometrics were constructed. The palaeogeographical reconstructions on the time of accumulation of the selected lithostratigraphic units (cyclites) were made. According to the results of complex core researches 24 lithogenetic types referred to 18 facial environments were selected and described. The conclusion about shallow marine genesis of the described deposits was made.

UDC 552.143

**Kravchenko G.G., Zhukovskaya E.A.**  
**DEPOSITIONAL MODEL OF UPPER JURASSIC PRODUCTIVE DEPOSITS OF KRAPIVINSKOE FIELD BY THE RESULTS OF STUDYING CORE**

The results of sedimentologic researches of upper Jurassic deposits by a drill-hole core of Krapivinskoe deposit in Tomsk region have been reflected. The structure of productive layers  $Y_u^2_1$  and  $Y_u^3_1$  was considerably detailed and ascertained, facial homogeneity of sediments of sub-, inter- and over-coal masses within the deposit was de-

termined. Facial maps, thickness maps, block diagrams illustrating geological evolution history were constructed. Distribution of perspective reservoirs on the areas of the Krapivinskoe deposit not covered with probe boring was predicted.

UDC [552.578.2.061.4:551.762/763.1]:[549.08+543.42](571.16)

**Devyatov V.P., Predtechenskaya E.A., Sysolova G.G.**  
**LITHOLOGIC-MINERALOGICAL CHARACTERISTIC AND RESERVOIR PROPERTIES OF OIL-BEARING MESOZOIC DEPOSITS BY DRILL-HOLE CORE VOSTOK 1, 3 (TOMSK REGION)**

The detailed lithologic-mineralogical characteristic of Early Cretaceous and Jurassic deposits by drill-hole core Vostok-1 and Vostok-3 has been given using the well logging suite, test results, methods of analysis: macroscopic, paleontological, petrographic, X-ray structure, luminescent, petrophysical and others. The conclusions on structure, deposit material composition, sources of debris drift, rock reservoir properties were drawn.

UDC 552.578.261.42

**Zhukovskaya E.A., Kravchenko G.G.**  
**THE INFLUENCE OF SECONDARY ALTERNATIONS ON RESERVOIR PROPERTIES OF UPPER JURASSIC PRODUCTIVE DEPOSITS OF KRAPIVINSKOE OILFIELD**

Estimation of the secondary mineral formation and changes of upper Jurassic container rocks of Krapivinskoe oilfield of Tomsk region have been given from the point of view of stage analysis. Stage changes of sand rocks to the stage of medium catagenesis and imposed ones are ascertained. Facial control is observed for rock stage transformations; the imposed processes are conditioned by geotectonical factor and by the processes of oil deposit existence. The degree of secondary process influence on reservoir properties is determined.

UDC 552.578.2.061.42

**Nedolivko N.M.**  
**EVOLUTION OF VOID-PORE SPACE IN OIL-WATER CONTACT AREAS**

Transformations of void-vapor space and material composition of sand container rocks in traps half-filled with oil are of zone nature. In area of oil saturation the sandstones underwent weak dissolution, they are characterized by rather high degree of safety of the components (quartz, field spars, debris of effusive, granitoid, silica and other rocks), polymineral chlorite-hydromicaceous-kaolinite cement and predominance of intergranular pores with simple morphology and rather smooth surfaces of the wall. In transitional and subcontour areas of oil-water contact the rocks are intensively dissolved, debris are replaced by secondary minerals, cement is recrystallized to caolinitic one, pore space is represented by combination of intergranular, intragranular, micro-caliper pores on the surface of debris with a complex tortuous form and intergranular pores in kaolinite cement. In cementation area the pore space is represented by single small residual pores and destructed partially or fully by the secondary quartz and calcite cement.

UDC 550.36

**Popov S.A., Isaev V.I.**  
**SIMULATION OF HYDROCARBON GENERATION AND EMIGRATION PROCESSES**

The analysis of the main developments by the problem of simulating the processes of oil formation has been carried out; the numerical model of hydrocarbon generation and emigration from source sediments has been implemented on the basis of some known algorithms, the model has been tested and its validity on deep well section having penetrated the Bazhenov formation has been estimated.

UDC 622.276.6

**Koshovkin I.N., Anuriev D.A., Deinezhenko A.L.**  
**THE ANALYSIS OF UNCERTAINTIES AT SIMULATION OF GAS-WATER ACTION ON OIL RESERVOIR APPLYING NEURAL NETWORKS**

The methodological approaches of quantitative estimation of uncertainties have been determined for achieving the efficiency of gas-

water action on oil reservoir. It was established that neural networks are the efficient instruments of carrying out the calculations and design of gas-water action parameters. The technique is worked out on a sector reservoir model.

UDC 550.42:577.4(571.1)

**Savichev O.G., Bazanov V.A., Skugarev A.A.,  
Kharanzhevskaja Yu.A., Shmakov A.V.  
WATER AND HYDROCHEMICAL REGIME OF EAST PART  
OF THE VASYUGAN BOG (THE WESTERN SIBERIA, RUSSIA)**

Hydrological and hydrochemical conditions of east part of the Vasyugan bog (Western Siberia, Russia) in limits of the Kluch river basin have been considered. Geoecological classification of this territory is executed. Mean values of elements of water balance and their seasonal distribution are determined. The runoff of the Kluch river is poorly connected to the rainfall because of bog regulation. The data on seasonal change of a chemical composition of moss bog waters are resulted. The most intensive hydrogeochemical processes proceed at bog suburbs.

UDC 550.42:577.4(571.1)

**Savichev O.G., Bolom I., Haranzhevskaya Yu.A.  
LONG-TERM CHANGES OF WATER BALANCE ELEMENTS OF  
SMALL RIVER BASINS IN THE SOUTH OF WESTERN SIBERIA**

Calculation of monthly water balance of small river basins in the south of Western Siberia (tributaries of the Tom' and Chaya rivers – the Poros, Basandayka, Kluch rivers) and the statistical analysis of long-term changes of seasonal and annual values of the rainfall, runoff flow and its losses have been executed. After 1970 there was a growth of temperature of atmospheric air and change of borders of hydrological seasons. The last 2–3 decades the increase of winter runoff (Basandajka river) is observed in the north of the Tom' river basin. In boggy territories of the Chaya river basin there was contrary statistically significant reduction of a runoff flow during the spring and winter periods owing to the certain reduction of rainfall. Anthropogenic influence on a runoff of the Poros, Basandayka, Kluch rivers is insignificant.

UDC 504.3.52.003.1(571.51)

**Savichev O.G., Kopylova Yu. G., Hvashevskaja A.A.  
ECOLOGICAL AND GEOCHEMICAL STATE  
OF THE ENVIRONMENT IN NORTHERN PART OF ANGARA  
RIVER BASIN (EAST SIBERIA)**

The results of estimation of ecological and geochemical state of environment components in a right-bank part of the Angara river basin (Northern Angarski Krai) have been introduced. Calculation of background values of hydrochemical and geochemical parameters is executed. In area of researches two basic landscapes (watersheds and river valleys) are allocated. The condition of these landscapes on a degree of a deviation from a background and maximum permissible concentration is estimated as satisfactory. The geochemical type of association of chemical elements is established.

UDC 911.6

**Bubin M.N.  
TERRITORY ZONING BY SYNCHRONISM OF MULTIYEAR  
WINTRY FLOW FLUCTUATION (BY THE EXAMPLE  
OF CHELYABINSK REGION)**

Rational use of water resources is the urgent problem for the largest economic regions. Zone-areal principle of indicating hydrological regions is the base of the rational nature management. Chelyabinsk region zoning by synchronism of multiyear wintry flow fluctuation on the basis of cluster and correlation analyses, interior Spearman correlation coefficients, probabilities of intra- and inter-cluster bonds subject to nature zoning is described in the article. Three regions and four subregions with synchronous wintry flow fluctuation were determined at this territory.

UDC 556;551.4

**Nikitenkov A.N., Dutova E.M.  
RIVER FLOW AND MORPHOMETRIC CHARACTERISTICS  
OF RIVER BASINS IN THE NORTHERN PART  
OF KUZNETSK ALA TAU**

Using the methods of geographic informational systems the morphometric characteristics of river basins in northern part of Kuznetsk Ala Tau have been obtained. By the data of long-term hydro-metric observations the values of river flow and its components, the peculiarities of their within-year variability were determined. The interaction of morphometric characteristics of river basins and flow module values was estimated by means of correlation analysis.

UDC 624.131

**Strokova L.A.  
ACCOUNTING SOIL OVERCONSOLIDATION  
IN CALCULATIONS OF EARTH SURFACE SETTLEMENT  
AT TUNNEL CONSTRUCTION**

The results of numerical simulation of earth surface settlement at tunnel construction have been introduced. The action of initial overconsolidation expressed through the coefficient of earth pressure at rest on settlement value is studied. It is shown that it is important to take into account this parameter for overconsolidated clay soils.

UDC 624.131

**Strokova L.A.  
METHODOLOGICAL ASPECTS OF DEVELOPING  
THE SOILS CALCULATION MODELS**

The technology of developing the soils calculation models has been considered, highs and lows of analytical and numerical models have been specified. The stages of constructing the numerical model are introduced, the ways of improving the technology of developing such models are offered. The examples of realizing the separate procedures of the given concept are considered.

UDC 622.24.053:531.5

**Shadrina A.V., Saruev L.A., Saruev A.L., Kolodin A.P.  
THE DEVELOPMENT OF A NEW CONSTRUCTION  
OF DRILL PIPE JOINTS**

The existing kinds of drill pipe joints have been analyzed. The development of construction of nipple joint is described. It allows transferring efficiently the power pulse energy to a rock destruction tool as well as automating the process of drill pipe screwing. The references for development of new kinds of joints are given.

UDC 553.048

**Bernatonis V.K., Bernatonis P.V.  
THE CONCEPT OF PEAT RESOURCE DEVELOPMENT  
IN MODERN ECONOMIC CONDITIONS  
(BY THE EXAMPLE OF TOMSK REGION)**

The exploration of peat deposits was usually carried out according to the existing regulatory documents in which the geologic-economic estimation of peat reserves was not provided. It is shown that in this connection the considerable part of the already explored peat deposits can not be currently developed. The conclusion was drawn that the peat deposits reserves should be revalued subject to the factors influencing profitability of their performance.

UDC 553(09)

**Pshenichkin A.I.  
FIELD ROUTES OF GEOLOGIST ALEXANDER  
IVANOVICH IVANOV**

The course of field of one of graduates of 1930 Tomsk the first Siberian Polytechnic which the self-denying work increased a country mineral-raw material base is described.