
НАУКИ О ЗЕМЛЕ

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LITHOGENESIS OF THE PERMIAN FORMATION OF THE AYAN-YURAKHISKY ANTICLINORIUM

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Lithogenesis of the Permian volcano-clastic deposits of the Ayan-Yurakh Anticlinorium are observed in the paper. Permian basin plays important role in the initial mobilizing and distribution of ore material. Origin of the ore gold formation in the Permian rocks is explained with the elision-catagenetic mechanism. The basic parameters of this mechanism are shown in terms of Atkan suite. Two lithofacies of the Atkan suite are recognized: shelf or delta front and shelf edge or slope break facies. Gold and volcanic material are deposited in Permian basin with the clastic products at the same time. Lateral distribution of the gold from one complex to another occurs during diagenesis.

Keywords: *Ayan-Yurakh Anticlinorium, atkan suit, upper Permian, ore gold, elision-catagenetic mechanism.*

References

1. Sidorov A.A. *Ocherki istoricheskoi metallogenii* [Essays on historical metallogeny]. Magadan, 1995, 68 p.
2. Khardikov A.E., Parada S.G., Kholodnaya I.A. Litologo-fatsial'nye usloviya zolotonosnosti verkhnepermiskikh otlozhenii Ayan-Yuryakhskogo antiklinoriya Yano-Kolymskoi skladchatoi oblasti [Litho-facies conditions of gold-bearing deposits of the Upper-Ayan Yuryakh anticlinorium Yano-Kolyma folded area]. *Rudy i metally*, 2009, no 3, pp. 22-28.
3. Khardikov A.E., Kholodnaya I.A. Litologo-fatsial'nye osobennosti i usloviya obrazovaniya verkhnepermiskikh otlozhenii Kolymskoi Ayan-Yuryakhskogo antiklinoriya Verkhoyano- skladchatoi oblasti [Litho-facies features and conditions of formation of deposits of the Upper-Ayan Yuryakh anticlinorium Verkhoyansk-Kolyma folded area]. *Stratigrafiya i sedimentologiya neftegazonosnykh provintsiy*, 2010, no 1, pp. 65-74.
4. Gablina I.F. *Usloviya medenakopleniya v krasnotsvetnykh kontinental'nykh formatsiyakh* [Accumulation of copper in terms of red continental formations]. Moscow, 1983, 111 p.
5. Kholodov V.N. *Novoe v poznanii katageneza. Elizionnyi katagenez* [New knowledge in katagenesis. Elyision katagenesis]. *Litologiya i poleznye iskopayemye*, 1982, no 5, pp. 15-32.
6. Surchilov V.A. *O [About Permian magmatism and tectonic nature Ayan-Yuryakh anticlinorium]. Nauka Severo-Vostoka Rossii – nachalo veka* [Science North-East of Russia - the beginning of the century]. Magadan, 2005, pp. 127-132.
7. Byakov A.S., Vedernikov I.L., Akinin V.V. *Permskie diamiktity Severo-Vostoka Azii i ikh veroyatnoe proiskhozhdenie* [Perm diamiktity Northeast Asia and their probable origin]. *Vestn. Sev.-Vost. nauch. tsentra DVO RAN*, 2010, no 1, pp. 14-24.
8. Astakhova A.A., Khardikov A.E. [On the prospects of gold-bearing Permian-Ayan Yuryakh anticlinorium Verkhoyansk-Kolyma folded area]. *Materialy 9 Ural'skogo litologicheskogo soveshchaniya* [Proceedings of the Ural lithological 9 meeting]. Ekaterinburg, 2012, pp. 12-13.

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MULTIVERSION COMPUTER SIMULATION OF SOUTH-JAKUT COAL BASIN FOUNDATION SURFACE

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The methodology of building South Yakutia Coal Basin foundation is developed concerning to using of initial geological-geophysical data at regional and prospecting geological exploration works stages and using of modern software tools including specialized ones (OKAR) and ArcGIS geographic information system. Ascertained geological and structural regularities can be used as independent informational blocks to predict of coal content in the lands of basin which are weakly examined.

Keywords: *methods, technology, model, foundation, OKAR, ArcGIS, geological-geophysical data, South Yakutia Coal Basin.*

References

1. *Ugol'naya baza Rossii. T. V, kn. 2: Ugol'nye basseiny i mestorozhdeniya Dal'nego Vostoka Rossii (Respublika Sakha, Severo-Vostok, o. Sakhalin, p-ov Kamchatka)* [Coal Russian base. Vol. 5, b. 2: Coal basins and deposits of the Far East of Russia (Republic of Sakha, Northeast, i. Sakhalin, p. Kamchatka)]. Moscow, 1999, 638 p.
2. *Vlasov V.M. Stroenie i usloviya obrazovaniya ugnosnoi formatsii Yuzhno-Yakutskogo basseina* [The structure and conditions of formation of coal-bearing formations of South-Yakutia basin]. Leningrad, 1983.
3. *Grebennikov G.A. [New ideas about the conditions of formation and formation type of coal-bearing deposits of the South Yakutia Basin]. Tez. dokl. VI Vsesoyuz. ugol'n. soveshch. [Proc. rep. VI All-Union. coal. conference]. P. I. Lvov, 1980.*
4. *Zhurbitskii B.I., Zhibankov G.A. Programnyi kompleks OKAR – «Obrabotka, korrelyatsiya, approksimatsiya, raspoznavanie» [Program complex IKAR – «Processing, correlation, approximation, recognition»]. VNIGRIugol'. Certificate FAIS, no 2013617557, 20.08.2013.*

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ABOUT CONNECTION PHYSICO-CHEMICAL PARAMETERS AND THE CONTENT OF RECOVERED GAS WITH SULFITE-REDUCING CLOSTRIDIA IN THE BOTTOM SEDIMENTS OF SMALL RIVERS

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*Based on own data of the original research of bottom sediments small rivers was shows the connection between sulfite-reducing clostridia (*Clostridium perfringens*, *C. sporogenes*) with the values of pH and Eh, methane and hydrogen sulphide. The regression models dependence between the number of sulfite-reducing clostridia and above listed indicators were created. Relatively low correlation coefficients were obtained presumably due to the influence of different factors and processes that can to obscure the connection closeness. These relations point out the possible participation of sulfite-reducing clostridia in the generation of methane and hydrogen sulphide in aquatic landscapes.*

Keywords: *sulphite-reducing clostridia, bottom sediments, hydrogen sulfide, methane, Eastern Donbass, sanitary-indicatory microorganisms.*

References

1. Grinenko V.A., Fedorov Yu.A. Issledovaniya vzaimosvyazi izotopnogo sostava sery sul'fatov s khimicheskim sostavom shakhtnykh vod Vostochnogo Donbassa [Researches the relationship of the isotopic composition of sulfate sulfur with chemical composition mine waters of the Eastern Donbass]. *Vodnye resursy*, 1990, no 6, pp. 152-161.
2. Fedorov Yu.A. *Stabil'nye izotopy i evolyutsiya gidrosfery* [Stable isotopes and the evolution of the hydrosphere]. Moscow, 1999, 370 p.
3. Dzyuban A.N. Maslyanokislye bakterii, odnosyashchiesya k rodu *Clostridium*, v donnykh otlozheniyakh vnutrennikh vodoemov raznogo tipa [Butyric acid bacteria belonging to the genus of *Clostridium*, in bottom sediments of inland waters bodies different types]. *Mikrobiologiya*, 2005, vol. 74, no 1, pp. 119-125.
4. Fedorov Yu.A., Morozova M.A., Trubnik R.G. [*Clostridium*: distribution, relations with hydrochemical indicators, methane and hydrogen sulfide in the water objects of Eastern Donbass]. *Sovremennye problemy gidrokhimii i monitoringa kachestva poverkhnostnykh vod* [Modern problems of hydrochemistry and monitoring of surface water quality]. Proceedings of the scientific conference. P. 1. Rostov-on-Don, 8-10 September 2015. Rostov-on-Don, 2015, p. 270-274.
5. Dmitrik L.Yu., Trubnik R.G., Afanas'ev K.A., Gar'kusha D.N., Fedorov Yu.A. [Expeditionary researches of small rivers and reservoirs of Eastern Donbass in 2014-2015]. *Ekologicheskie problemy. Vzgl'yad v budushchee* [Environmental problems. A look into the future]. Coll. tr. VII Intern. scientific-practical. conf. Rostov-on-Don, 2015, pp. 137-139.
6. Trubnik R.G., Fedorov Yu.A., Morozova M.A. [Distribution of sulphite-reducing clostridia in bottom sediments of the Eastern Donbass water bodies and their connection to hydrochemical indicators]. *Aktual'nye problemy nauk o Zemle* [Actual problems of Earth Sciences]. Coll. tr. scientific conf. students and young scientists with intern. participation. Rostov-on-Don, 2015, pp. 247-250.
7. *Opredelitel' bakterii Berdzhi* [The determinant of bacteria Burgi]. Vol. 2. Transl. from Engl. Ed. J. Holt, N. Krieg, P. Snit. Moscow, 1997, 368 p.
8. Puchenkova S., Vinnov A. Sul'fitredutsiruyushchie kloctridii v upakovannoi rybnoi produktsii [Sulphite-reducing clostridia in packaged fish products]. *Prodovol'cha industriya APK*, 2011, no 5 (13), pp. 32-34.
9. Pilipenko I.V. *Clostridium perfringens*: kharakteristika, biologicheskoe deistvie, indikatsiya v pishchevykh produktakh [Clostridium perfringens: characteristic, biological action, the indication in foods]. *Tekhnologicheskii audit i rezervy proizvodstva*, 2015, no 2/4 (22), pp. 4-8.

10. Bylova N.A., Kafarskaya L.I., Chernaya Z.A. Rol' Cl. difficile v razvitií sistemnogo vospaleniya u chasto gositaliziruyushchikhsya patsientov s KhSN [The role Cl. difficile in the development of systemic inflammation among frequently hospitalized patients with heart failure]. *Serdechnaya nedostatochnost'*, 2011, vol. 12, no 1, pp. 31-35.
11. Shevchenko A.A., Chernykh O.Yu., Shevchenko L.V. i dr. *Diagnostika klostridiov zhivotnykh* [Diagnostics of klostridiov among animals]. Krasnodar, 2013, 36 p.
12. Morozova M.A., Fedorov Yu.A. Rol' sul'fitredutsiruyushchikh klostridii v patologii u ryb [The role of sulfite-reducing clostridia in the pathology of fishes]. *Izv. vuzov. Sev.-Kavk. region. Estestv. nauki*, 2015, no 1, pp. 60-66.
13. Guran H.S, Vural A., Erkan M.E. The prevalence and molecular typing of Clostridium perfringens in ground beef and sheep meats. *J. of Consumer Protection and Food Safety*, 2014, vol. 9, pp. 121-128.
14. *Rukovodstvo po meditsinskoj mikrobiologii. Obshchaya i sanitarnaya mikrobiologiya* [Manual of medical microbiology. General and sanitary microbiology]. Ed. A.S. Labinskaya, E.G. Volina. Moscow, 2008, 1080 p.
15. Regestein L., Doerr E. W., Staaden A., Rehmann L. Impact of butyric acid on butanol formation by Clostridium pasteurianum. *Bioresource Technology*, 2015, vol. 196, pp. 153-159.
16. Gar'kusha D.N., Fedorov Yu.A., Khromov M.I. Metan v vode i donnykh otlozheniyakh ust'voi oblasti Severnoi Dviny (Beloe more) [The methane in water and bottom sediments of the Northern Dvina mouth area (White Sea)]. *Okeanologiya*, 2010, vol. 50, no 4, pp. 534-547.
17. Fedorov Yu.A., Tambieva N.S., Gar'kusha D.N., Khoroshevskaya V.O. *Metan v vodnykh ekosistemakh* [The methane in aquatic ecosystems]. Rostov-on-Don, Moscow, 2005, 329 p.
18. *Massovaya dolya sul'fidnoi sery v donnykh otlozheniyakh. Metodika vypolneniya izmerenii fotometricheskim metodom s N, N-di-metil-p-fenilendiaminom* [Mass fraction of sulphate sulfur in bottom sediments. The technique of measurement photometric method with N, N-di-methyl-p-phenylenediamine]. Certificate, no 52.24.525-2011. Rosgidromet (GU GKHI). 2011, 26 p.
19. *Produkty pishchevye. Metod opredeleniya Clostridium perfringens* [Food products. Method for the determination of Clostridium perfringens]. Certificate, no 10444.9-88.
20. McLaughlin M.R., Brooks J.P., Adeli A. Temporal flux and spatial dynamics of nutrients, fecal indicators, and zoonotic pathogens in anaerobic swine manure lagoon water. *Water Research*, 2012, vol. 46, pp. 4949-4960.
21. Fedorov Yu.A., Grinenko V.A., Ustinov V.I. Osobennosti fraktsionirovaniya izotopov sery i kisloroda sul'fatov ozera Bol'shoi Tambukan [Features fractionation of sulfur and oxygen isotopes at lake sulfates Big Tambukan]. *Geokhimiya*, 2004, no 1, pp. 111-115.
22. Fedorov Yu.A., Potapov E.G., Danilov S.R., Salov G.V. Osobennosti dinamiki gidrologicheskikh parametrov, gidrokhimicheskikh, biogeokhimicheskikh pokazatelei i komponentov rapy i sul'fidnoi gryazi oz. Bol'shoi Tambukan [Features of dynamics of hydro-geological parameters, hydrochemical, biogeochemical indicators and brine components and sulphide mud lake Large Tambukan]. *Izv. vuzov. Sev.-Kavk. region. Estestv. nauki*, 2002, anniversary issue, pp. 72-76.