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I.S. Slesarev (Lukoil PAO, Moscow, Russian Federation), **A.R. Sadykova** (Institute of Energy Resources Transportation OOO, Ufa, Russian Federation)

ON THE SELECTION OF DEPRESSANTS FOR PIPELINES LOCATED IN COMPLEX GEOCRYOLOGICAL CONDITIONS

Background

The paper is devoted to an important and urgent problem – to improve reliability and safety of the well stream gathering systems in the field named after A. Titov, located in the Nenets autonomous district. The field territory is the northern climatic zone.

Aims and Objectives

To develop substantiated engineering solutions on improving reliability of oil gathering under complex geological and permafrost conditions of the region using analysis of environmental conditions and considering for surface laying of pipeline.

Methods

Laboratory tests.

Results

As low temperatures impact on the rheological properties of oil, it was proposed that depressants should be used to lower the pour point of oil. A large volume of experiments was conducted with a number of additives to test their effectiveness at the doses of 50,100, and 500 g/t of oil.

It is stated that the reagents pre-chosen for analogous oils may be ineffective when used for a certain oil of the deposit. Reasons are given for depressant selection only by results of direct laboratory testing.

Key words: oil field, pipelines, corrosion, depressant, low temperature, geocryological conditions

References

1. *Federal'nyi zakon ot 07.05.2001 g. No. 49-FZ «O territoriyakh traditsionnogo prirodopol'zovaniya korennykh malochislennykh narodov Severa, Sibiri i Dal'nego Vostoka Rossiiskoi Federatsii». Prinyat Gosudarstvennoi Dumoi 4 aprelya 2001 goda* [Federal Law dd. 07.05.2001 No. 49-ФЗ « About Territories of Traditional Use of Natural Resources by Not Numerous Indigenous Peoples of the North, Siberia and the Russian Far East». Adopted by the State Duma 04.04.2001]. (in Russ.).
2. *GOST 16350-80. Klimat SSSR. Raionirovanie i statisticheskie parametry klimaticheskikh faktorov dlya tekhnicheskikh tselei* [GOST 16350-80. Climate of the USSR. Regionalism and Statistical Parameters of Climatic Factors for Technical Purposes]. Moscow, 1981. 114 p. (in Russ.).
3. *Predvaritel'nye materialy otsenki vozdeistviya na okruzhayushchuyu sredu k materialam obosnovaniya investitsii v obustroistvo mestorozhdenii im. R. Trebsa i im. A. Titova OAO ANK «Bashneft'» (Tsentr ekologicheskogo proektirovaniya, inzhiniringa i innovatsii)* [Preliminary Materials of Estimating the Environmental Impact, to be Used in the Materials Substantiating Investments in the Development of ANK «Bashneft» Fields Named after R. Trebs and A. Titov (Centre for Environmental Design, Engineering and Innovations)]. Saint-Petersburg, 2011. 305 p. (in Russ.).
4. Il'in A.N., Polishchuk Yu.M., Yashchenko I.G. Vysokoparafinistye nefti: zakonomernosti prostranstvennykh i vremennykh izmenenii ikh svoistv [High-Paraffin Crudes: Patterns of Spatial and Temporal Variations of Their Properties]. *Neftegazovoe delo – Oil and Gas Business,* 2007, URL: http://ogbus.ru/authors/iliin/iliin_1.pdf. (in Russ.).
5. Pozdnyshev G.N. *Stabilizatsiya i razrushenie neftyanykh emul'sii appendix* [Stabilization and Breaking of Oil Emulsions]. Moscow, Nedra, 1982. 221 p. (in Russ.).
6. Toptygin S.P., Yusupov O.M. K voprosu sbora i transporta anomal'nykh neftei [To the Issue of Gathering and Transport of Abnormal Crudes]. *Tezisy dokladov XXVIII shkoly-seminara po problemam mekhaniki sploshnykh sred v sistemakh dobychi, sbora, podgotovki, transporta i pererabotki nefti i gaza* [Abstracts of Papers for the XXVIII School-Seminar on the Problems of Continuum Mechanics in the Systems of Oil and Gas Production, Collection, Treatment, Transportation and Refining and Processing]. Ufa, 2004. S. 79-83. (in Russ.).
7. Nguyen Thuk Khang, Tong Kan Shon, Akhmadeev A.G., Le Din Khoe, Doan Tien Ly. Problemy puska i ekspluatatsii truboprovodov, perekachivayushchikh vysokoparafinistye nefti pri nizkoi proizvoditel'nosti [Problems of Start and Operation of Pipelines Pumping High-Paraffin Crudes at Low Capacity. *Materialy XI Vserossiyskoy nauchno-prakticheskoy konferentsii «Energoeffektivnost'. Problemy i resheniya» 19 oktyabrya 2011 g.* [Proceedings of XI All-Russian Scientific and Practical Conference «Power Efficiency. Problems and Solutions» October, 19, 2011]. Ufa, 2011, pp. 219-220. (in Russ.).
8. Koern R.A., Gulina N.N. Transportirovka vysokoparafinistykh neftei po morskomu truboprovodu [Offshore Pipeline Transportation of High-Paraffin Crudes]. *Oil & Gas Journal,* 2012, No. 5 (60), pp. 58-62. (in Russ.).
9. *GOST R 12.4.236-2011. Sistema standartov bezopasnosti truda. Odezhda spetsial'naya dlya zashchity ot ponizhennykh temperatur. Tekhnicheskie trebovaniya. Prilozhenie A «Klimaticheskie poyasa Rossiiskoi Federatsii»* [GOST R 12.4.236-2011. Occupational Safety Standards System. Protective Clothing for Low Temperatures. Technical Requirements. Appendix A «Climate Zones of the Russian Federation»]. Moscow, 2012. 32 p. (in Russ.).
10. *GOST 20287-91. Nefteprodukty. Metody opredeleniya temperatur tekuchesti i zastyvaniya* [GOST 20287-91. Petroleum Products. Methods of Test for Flow Point and Pour Point]. Moscow, 1992. (in Russ.).
11. *GOST 1929-87. Nefteprodukty. Metody opredeleniya dinamicheskoi vyazkosti na rotatsionnom viskozimetre* [GOST 1929-87. Petroleum Products. Methods of Test for Determination of Dynamic Viscosity by Rotary Viscosimeter]. Moscow, 1988. 18 p. (in Russ.).
12. VNTP 3-85. Normy tekhnologicheskogo proektirovaniya ob"ektov sbora, transporta, podgotovki nefti, gaza i vody neftyanykh mestorozhdenii [Norms of Technological Design of Facilities for Collection, Transport and Treatment of Oil, Gas and Water of Oil Fields]. Moscow, Minnefteprom, 1986. 93 p. (in Russ.).

The Authors

• Slesarev Ivan S.
Lukoil PAO
Chief Specialist of Scientific and Technical Support Division of the Office of Scientific and Technical Work, the Department for Industrial Safety, Ecology and Scientific and Technical Activities

11, Sretenskii blvd., Moscow, 101000, Russian
Federation
e-mail: slesarev_ivan@mail.ru

• Sadykova Aygul R.
Institute of Energy Resources Transportation OOO
Junior Researcher of the Sector of Hydrodynamics, Rheology and Reduced Losses of Oil and Products
144/3, October ave., Ufa, 450055, Russian
Federation
tel: (347) 241-85-81
e-mail: Aigul-cad@mail.ru