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A COMBINED METHOD OF INCREASE OF FLUIDITY OF HIGH-VISCOUS LOCAL OIL

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Annotation:
In this research work results of influence of electromagnet square to reologic peculiarity of petroleum are given. Decreasing more than 20 gradusselcium of energy of active of petroleum influence on electromagnet square was observed.

Key words: High stickiness, reologic peculiarity, flowing, electromagnet square, high frequency

INTRODUCTION:

As it has been mentioned in the previous part, for increase of fluidity of high viscous oil in practice they use the following kinds of influence over oil and its mixtures thermo processing, dilution, gas saturation, mechanical interfusion, electric and chemical processing. Other variants of combined realization of high-pointed methods of processing of high-viscous oil before their transposition after the pipeline are possible. The results of our analyses after the increase of fluidity of high-viscous local oil with using suggested Technical cotton phosphatite consentrate (additive) and electromagnetic processing showed that their combined utilization for achievement of made purpose is possible. In Uzbekistan they more often use chemical method of processing of high-viscous oil, found on use of expensive imported additives. To the number of such additives you should relate highmolecular polimerical combination (for example, sopolimers vinitcetat with acrilats or sopolimers of alkens with acrilats) functionally replaced ammonium combinations, containing polar oxygen-holding

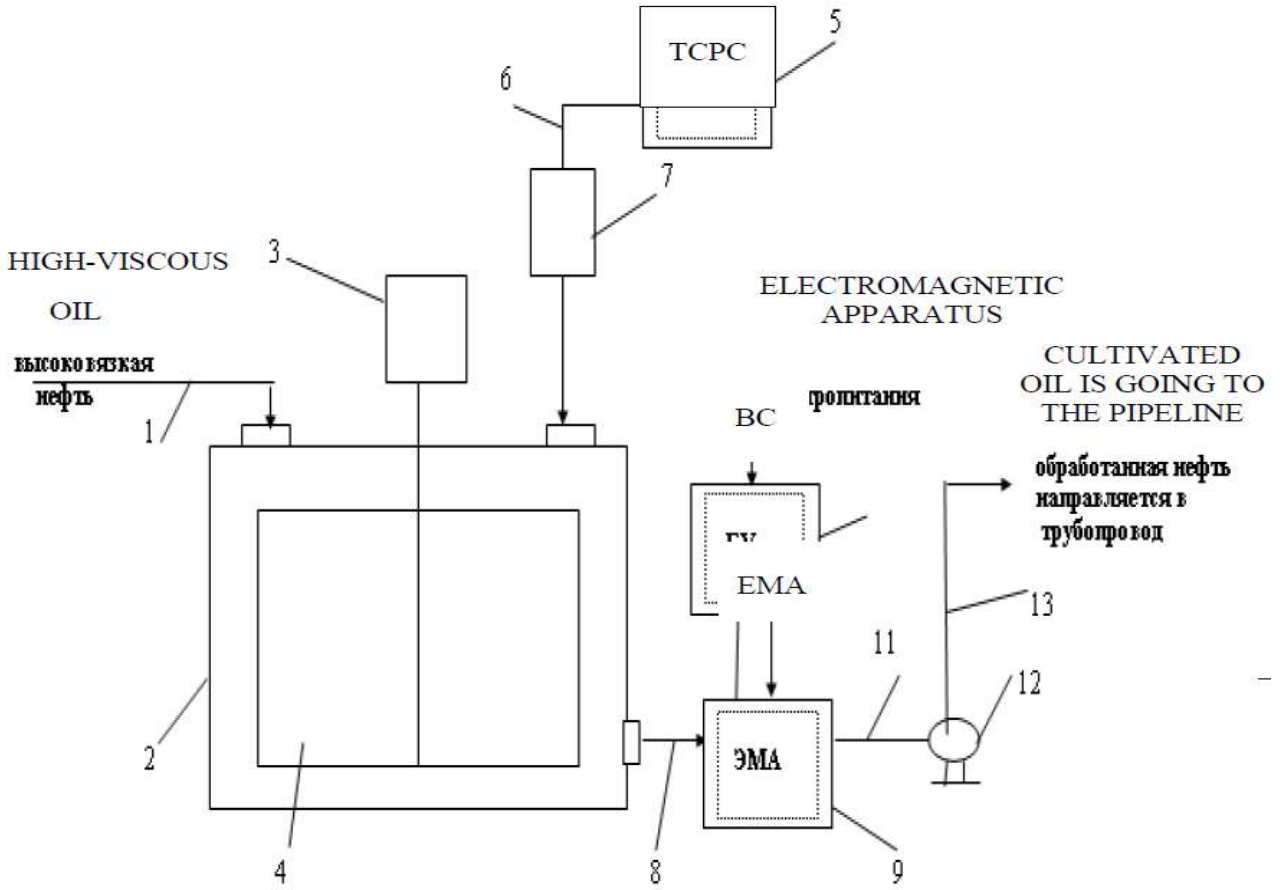
burstings of hydrophobiousness of carbon-hydrogen radicals. Ammonium combinations which have the structure N-(alkilfenoxynoly (etilenoxy) carbonilmetil) ammonium chlorids and N-(alkoxynoly (etilenoxy) carbonilmetil) ammonium chlorides, which are got from alkens-1 (for instance of detcen-1) exert influence on reological quality. Sopolimers of alkens with vinilatcetat, Sopolimers of alkens with essential of unbreaking acidis are more wide used as the additeves of high-viscous oil (for example acril or metacril). Unfortunately these additives are little effective by regulation of reological quality of local oil with high maintenance of resinous substancers and paraffins.

So, the search of new effective methods of increase of fluidite of high-viscous oil is an actual task. Accounting that we, using suggested additive technical cotton phosphatite concentrate and electromagnetic processing of high-viscous oil, worked out a combined method of their joint use before transposition of high-viscous oil after the pipeline.

For this the use electrical method promotes a partial regulation of reological quality of high-viscous oil before their transposition. The main point of a given method is that in this field in the spheres of frequencies coinciding with own frequencies of the revolving rotation of difielded moments of liquid, appears a magnetic reological effect which display to a marked degree as an increase so a decrease of effective viscosity in dependence on the direction and intensity of the field.

For the research of a combined method of processing of high-viscous local oil with use technical cotton phosphatite concentrate and electromagnetic affect,the technical plant was worked out by us,the scheme of which is shown in the picture 4.3.

This plant functions in the following way: to the assembly 2 over the line 1 a high viscons oil is brought. From the capacity 5 the additive technical cotton phosphatite concentrate over the line 6 with the help of the dosimeter reaches the capacity 2 where interfusion of the mixture of oil with additive is made with the help of the mover 3 and the mixer 4. From the assemble 2 the mixture passes over the line 8 through the electromagnetic apparatus (E M A) 9 which is operated by the block of control (B C) 10 A magnated mixture of oil with the additive technical cotton phosphatite concentrate over the line 11 with the help of the pump 12 goes to the pipeline 13 Using this plant the following kinds of models of local oil were worked out by us (table 4.5)



Picture. 4.3. The technological plant for a combined processing of high-viscous oil with use of additive technical cotton phosphatite concentrate and high-frequency electromagnetic affect before its transposition after pipeline

Table 4.5 Phyusical and chemical indexes of high-viscous local oil

The name of the indexes of oil	The name of the oil-fields			
	Mirshadi	Andijan	The Southern Alamishik	Kokdumalak (control)
Density with 20^0C, kg/sm^3	0,961	0,858	0,849	0,873
Temperature of freeze,^{0}C	+4	+7	+5	-10
Maintenance, %				
-paraffin's	8,8	13,4	21,3	3,8
-resins'	38,7	8,6	10,3	4,7
-asphaltens'	8,35	1,5	0,6	2,9
-sulphur's	3,4	0,3	0,2	8,1

From the table 8 you see that the first three kinds of oil (the oilfields Mirshadi, Andijan and The Southern Alamishik) are belong to paraffinic and high-paraffinic oil as compared with the oilfield Kokdumalak (control). And what's more, these models have a great

number of resins (more 8,6%). Temperature of freeze of these oil in the limit from (+4) to $(+7)^0$ C.

Therefore, high maintenance of paraffins and resinous asphalted substances in local oil (except the oilfield Kokdumalak) inclinedly to interaction among molecules and formation of sediment in the form of solid phase. By the transposition of this oil or its mixtures the productivity of oilpipeline will befalling because of the formation of layers, the verges of which depend on their colloid-dispersious condition.

We analysed the reological qualities of these oil on the rotational viscosimetre "Reostat-2.1" with temperature $20\text{-}80^0$ C and speed of displacement $2\text{-}1312c^{-1}$. For this the quantity of added additive technical cotton phosphatite concentrate was 500g/t, and the frequency of electromagnetic affect was 30 Megahertz.

In the table 4.6. the results of analyse of dependence of speed of displacement (Dr)on the stress of displacement (Tr)for the oilfield "Mirshadi" before and after affect on it by electromagnetic field are shown.

From the table 4.6. you see that by nature of an obtained dependence in the fields of temperatures $45\text{-}60^0$C the oil of oilfield "Mirshadi" is not Newton's pseudoplastic liquid. The stream of this oil over the pipeline doesn't submit to Newton's law because of formation into it the structures of crystallized particles of paraffins.With the rise of temperature formatted structures gradually destroy and oil of this oil field acquire the qualities of Newton's liquid that is its viscosity becomes a proportional applied effort.

We learnt the influence of a combined processing of high-viscous oil of oilfields "Andijan" and "The Southern Alamishik" on their viscosity with various temperatures.

The significances of stress of displacement (τ_r)	**The significances of the speed of displacement (D_r) with following temperatures, ^{0}C**			
	45	**55**	**60**	**70**
Before magnetic processing				
5	200	290	400	490
10	400	600	950	1150
15	620	1000	1300	-
20	900	1200	-	-
After high-frequency electromagnetic processing with 30 Megahertz				
5	310	400	460	500
10	580	800	1100	1200
15	1000	1300	1450	-

From the table 4.7 you see that the most of effect of lowering of viscosity of local oil is attained with lower temperatures $(40\text{-}50^0$C)

Probably the high-frequency electromagnetic processing (30 Megaherz) promotes to the destruction of excited structural formations of not Newton's oil and because of it the

decrease their viscosity. With low temperatures paraffin comes into the structure of associates of oil, and with dialectical heating comes out of the structure into the separate phase because of destruction of associates.

Table 4.7 The change of viscosity (μ) by temperature (t) of oil of the oil fields "Andijan" and "The Southern Alamishik" before and after their electromagnetic processing (with speed of displacement Dr=1312 c^{-1})

Temperature, ^{0}C	**Viscosity of oil (μ) .μ Па.с**	
	oilfields «Andijan»	**oilfields «The Southern Alamishik»**
before magnetic processing		
40	22,7	29,6
50	15,2	18,3
60	11,5	15,4
70	6,0	7,5
Electromagnetic processing with 30 Megahertz		
40	17,8	23,0
50	12,5	14,2
60	9,0	11,5
70	5,6	5,9

In the table 4.8 results of calculation of energy of activation of viscous stream of local oil with dependence « lg η $^{-1/T}$ ». .

Table 4.8 The indexes of energy of activation of viscous stream of oil of the oilflied "Andijan" before and after the affect by magnetic field (with 20-60^{0}C)

Reverse absolute temperature, K^{-1}	**lg η**	**Energy of activation of viscous stream of oil, кDj/mol**
before the affect by magnetic field		
2,8	0,75	}42,8
3,0	1,00	
3,2	1,45	
After the affect by magnetic field.		
2,8	0,65	}34,5
3,0	0,90	
3,2	1,20	

From the table 4.8 you see that obtained significances of energy of activation of oil of the oilfield "Andijan" with 20-60^{0}C they compared with the significances of energy of the weak chemical bonds.

The further analyses showed that with 60-80^{0}C the magnetic field practically doesn't have influence on the energy of activation of viscous stream of oil of the oilfield "Andijan" which is 21 kilj joule/mole. This is an energy which is necessary for physical interactions. So, the conducted analyses showed that for the increase of fluidity of local high-viscous oil worthwhile and effectively use the combined method, foreseeing joint use of offered additive technical cotton phosphatite concentrate in the number to 500 g/t and their high-frequency electromagnetic processing with 13-30 Megahertz.

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