GAS CONDENSATE OF THE SHURTAN FIELD IS A RAW MATERIAL FOR PETROCHEMICALS

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Annotation
The properties and composition of raw materials - gas condensate of the Shurtan field for the petrochemical industry with a potential content of aromatic, aliphatic and naphthenic hydrocarbons, as well as forthe production of solvents of paints and varnishes - were studied. A method of rectification was developed and the mode of processing of gas condensate (HA) was determined and the dissolving abilities for butanol and aniline points of solvents obtained from HA were studied. physicochemical parameters of solvents from HA. Three types of hydrocarbon fraction were used for the analysis: 1-fraction 120-160; 2-fraction 160-220; 3-fraction 120-220.
Key words: *Gas condensate, solvent, paint and varnish material, rectification, phlegm, fraction, hydrocarbons, aromatic hydrocarbons.*

A potential area of use of solvents is the production and use of paint and varnish materials, which is determined by their successful combination in the dispersions of varnishes and paints, high dissolving ability of various binders (resins), relatively low toxicity, lack of corrosive activity, etc. Solvents are actively involved in the formation of an effective structure and properties of the protective coating (film) [1-2].

To obtain solvents of paints and varnishes (paint and varnish materials), stable GC (gas condensates) of the Shurtan natural gas field were used. Shurtan GC has the following characteristics:1. A_{1-2} H_2 F_{2-3} (1-class; A_{1-2} - the content of AU in the gasoline fraction; H_2 - the content of alkanes in the diesel fraction; F_2 -z -fractional composition). The group composition of the Shurtan GC is a peculiar content of AU 25-29% by weight, aliphatic - 45% by weight, naphthenic - 24-25% by weight. The average molecular weight is 164, the refractive index is 1.4417, the specific gravity is 0.769 g/cm3 [3].

Research methods.

System solvents from HA were obtained on the oil rectification apparatus (ARN-2). The selection of the HA fraction was made up to 220 ° C, the following were obtained: gasoline fraction - with 35-150 ° C; solvent of paints of the oil solvent type (Nefras-A-130/150) [4]. with an interval of boiling points from 120-160 ° C, conventionally called GKLKM-S3-120 /160; heavy oil solvent (Nephras-A-120/200) with an interval of boiling points of hydrocarbons of the GC from 160-220 ° C, conventionally called GKKM-A-160/220 and a fraction of hydrocarbons with a boiling point of 120-220 ° C was obtained , which is a system solvent of the white spirit type (Nephras-C4-155/200), conventionally called GCCM-C4-120/220 [5].

The dissolving abilities of solvents of the GK-LCM series are determined by the effective phase equilibrium of their solutions with a standard resin, that is, Kauri - butanol point (KB) and aniline point (AT) depending on different concentrations of solvents.

Table 1. Physicochemical parameters of solvents from gas condensate

Indicators	Solvents from HA		
	GKKKM - C3-120/160	GKKKM-A-160/220	GKKKM - C4-120/220
Density, g/s m^3	0,864	0,835	0,780
Temperature at the beginning of the kip. °C,	120	160	120
Temperature con. Kip. °C,	160	220	220
Residue in the flask, %,	1,5	1,5	2,0
Flash point in closed crucible, °C,	28	45	41
Volatility on xylene	1,0 - 1,2	3,5 - 4,0	3,0 - 4,5
Aniline point, °C,	49	50	45
Kauri-butanol point, g	54	34	43
Mass fraction, %, wt: aromatic hydrocarbons and sulfur compounds	2,9	27,7	11,9
	0,0062	0,0145	0,0053
Content of mechanical impurities and water	away.	away.	away.
Copper Plate Test	endure.	endure.	endure.
Color on the iodometric scale, mg/l iodine	transparent	transparent	transparent
MPC, mg/ m^3	200	150	300

Three fraction samples were used for the analysis: 1-fraction 120-160; 2-fraction 160-220; 3-fraction 120-220. In the study of each fraction, indicators such as mass fraction, mole fraction and octane number of components were obtained.
Results of the study.
Table 2 shows the mass fraction, molar fractions and octane numbers of components of the sample 1-fraction 120-160 obtained from the gas condensate of the Shurtan field of natural gas.

Table 2. Physical and chemical parameters 1-fraction 120-160

Mass, %						
C_n\Groups	**Paraffins**	**Isoparaffins**	**Aromatics**	**Naphthenes**	**Olefins**	**Sum**
C_6	0	0,0213087	0	0,0290381	0	0,050
C_7	0,0323839	0,058821	0,174011	0,444032	0,745985	1,455
C_8	0,0147179	7,55482	0,0983555	2,04735	0,672183	10,387
C_9	1,70615	3,15115	0,177065	1,49873	1,19583	7,729
C_{10}	0	2,62506	1,28202	0	0,671401	4,578
C_{11}	0,114645	0,860999	0,694287	0	0	1,670
C_{12}	0,040335	0,187062	0,4905	0,0717787	0	0,790
C_{13}	0,0660757	0	0	0	0	0,066

Sum	1,974	14,459	2,916	4,091	3,285	26,726
Mole, %						
C_n \ Groups	**Paraffins**	**Isoparaffins**	**Aromatics**	**Naphthenes**	**Olefins**	**Sum**
C_6	0	0,054842	0	0,0711985	0	0,126
C_7	0,0969167	0,176037	0,478416	1,30209	2,16293	4,216
C_8	0,0502095	25,7729	0,311596	6,86154	2,24491	35,241
C_9	6,53533	12,0704	0,635617	5,65039	4,50842	29,400
C_{10}	0	11,1543	5,17285	0	2,81259	19,140
C_{11}	0,535216	4,01954	3,06324	0	0	7,618
C_{12}	0,205191	0,951613	2,37742	0,360841	0	3,895
C_{13}	0,363528	0	0	0	0	0,364
Sum	7,786	54,200	12,039	14,246	11,729	100,000
Octane number						
Component		Research Method			Motor method	
Paraffins		1,561			0,788	
Isoparaffins		8,390			7,414	
Aromatics		2,337			2,073	
Naphthenes		3,699			1,966	
Olefins		2,831			1,902	
Oxygenates		0,000			0,000	
Sum		18,819			14,143	

In addition, the molecular weight of the mixture is -33.484 g/mol, the density of the mixture is -194.894 kg/m3, the saturated vapor pressure is -1.034 kPa, the total number of known components is -84.

Table 3 shows the indicators of the mass fraction, molar fractions and octane numbers of the components of the sample 2-fraction 160-220 obtained from the gas condensate of the Shurtan field of natural gas.

Table 3. Physical and chemical parameters 2-fraction 160-220

Mass, %						
C_n \ Groups	**Paraffins**	**Isoparaffins**	**Aromatics**	**Naphthenes**	**Olefins**	**Sum**
C_7	0	0,00685892	0	0	0,0052018	0,012
C_8	0	0,0882948	0,067493	0,0052197	0,0771329	0,238
C_9	0,166521	0,905877	0,130587	1,15342	0,00502853	2,361
C_{10}	1,30491	3,81055	5,56706	0	0	10,683
C_{11}	1,48591	1,22877	18,1423	10,3897	1,174	32,421
C_{12}	0,258342	1,27774	3,84365	0	0	5,380
C_{13}	0,0659562	0	0	0	0	0,066
Sum	3,282	7,318	27,751	11,548	1,261	51,161

Mole, %						
C_n \ Groups	**Paraffins**	**Isoparaffins**	**Aromatics**	**Naphthenes**	**Olefins**	**Sum**
C_7	0	0,00921526	0	0	0,0068479	0,016
C_8	0	0,135225	0,095992	0,0078534	0,116006	0,355
C_9	0,286353	1,55776	0,210448	1,95221	0,00851096	4,015
C_{10}	2,48923	7,26896	9,98112	0	0	19,739
C_{11}	3,11421	2,57528	35,9812	19,7404	2,4287	63,840
C_{12}	0,59	2,91809	8,36346	0	0	11,872
C_{13}	0,162904	0	0	0	0	0,163
Sum	6,643	14,465	54,632	21,700	2,560	100,000
Octane number						
Component	**Research Method**				**Motor method**	
Paraffins	2,937				2,619	
Isoparaffins	6,351				5,607	
Aromatics	25,007				22,830	
Naphthenes	10,313				9,167	
Olefins	1,138				1,010	
Oxygenates	0,000				0,000	
Sum	45,746				41,232	

Along with the above, the molecular weight of the mixture is -74.586 g / mol, the density of the mixture is -429.275 kg / m^3, the saturated vapor pressure is -0.262 kPa, the total number of known components is -87.

Table 4 shows the indicators of mass fraction, molar fractions and octane numbers of components of the sample 3-fraction 120-220 obtained from the gas condensate of the Shurtan natural gas field.

Table 4. Physical and chemical parameters 3-fraction 120-220

Mass, %						
C_n \ Groups	**Paraffins**	**Isoparaffins**	**Aromatics**	**Naphthenes**	**Olefins**	**Sum**
C_6	0	0,0399284	0	0,0323979	0	0,072
C_7	0,0363909	0,0508683	0,00700836	0,408687	0,721257	1,224
C_8	0	1,00669	0,267148	0,82189	1,10558	3,201
C_9	0,474768	5,04869	1,05997	0,941049	0,0446563	7,569
C_{10}	0	5,58207	3,18547	0	0,098078	8,866
C_{11}	0	0,558294	6,23201	0	0	6,790
C_{12}	0,084716	0,406543	1,15552	0,24716	0	1,894
C_{13}	0,0313131	0	0	0	0	0,031
Sum	0,627	12,693	11,907	2,451	1,970	29,648

Mole, %						
C_n \ Groups	**Paraffins**	**Isoparaffins**	**Aromatics**	**Naphthenes**	**Olefins**	**Sum**
C_6	0	0,0858139	0	0,0663344	0	0,152
C_7	0,0909458	0,127127	0,0160904	1,00078	1,74849	2,983
C_8	0	2,86785	0,706748	2,30019	3,09312	8,968
C_9	1,51863	16,1491	3,17743	2,9627	0,140591	23,948
C_{10}	0	19,807	10,6628	0	0,343096	30,813
C_{11}	0	2,17649	23,0134	0	0	25,190
C_{12}	0,359883	1,72704	4,67694	1,03757	0	7,801
C_{13}	0,143861	0	0	0	0	0,144
Sum	2,113	42,940	42,253	7,368	5,325	100,000

Octane number		
Component	**Research Method**	**Motor method**
Paraffins	0,484	0,272
Isoparaffins	9,933	7,991
Aromatics	10,825	9,818
Naphthenes	2,105	1,440
Olefins	1,787	1,170
Oxygenates	0,000	0,000
Sum	25,133	20,690

With all this, the molecular weight of the mixture is -40.098 g / mol, the density of the mixture is -235.376 kg / m3, the saturated vapor pressure is -0.618 kPa, the total number of known components is -95.

From the above studies, it can be concluded that, according to the new raw material facility, Shurtan GC and its hydrocarbon fractions in qualitative and quantitative composition are potential and acceptable for the development of technologies for obtaining solvents for paints.

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