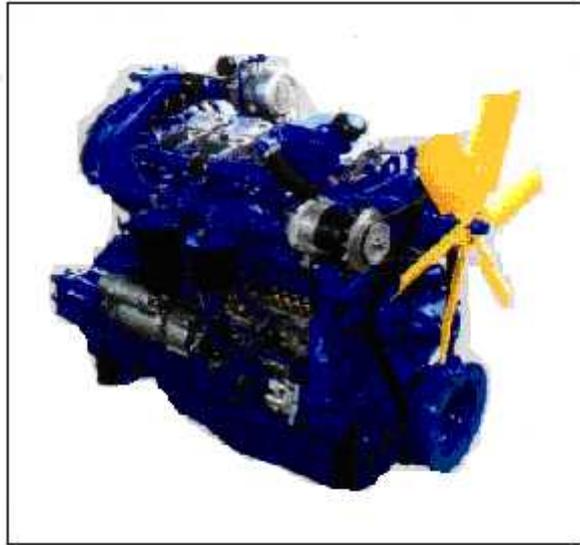


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3.		14
4.	.	20
5.		29
6.		38
7.		41
8.		49
9.		58
	(	
10	)	65
11		69
12		75
13	.	77
14		78

20-30%

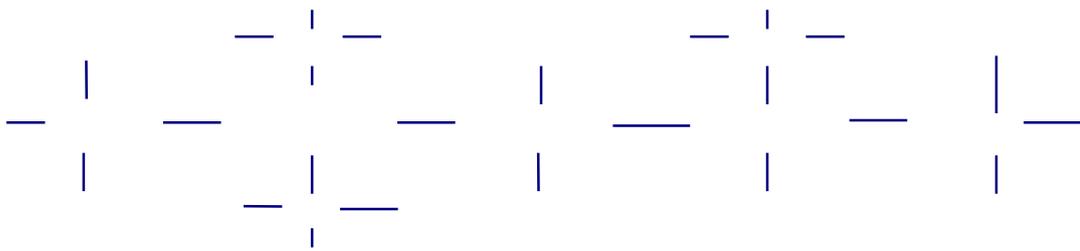


17

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2,2,4-

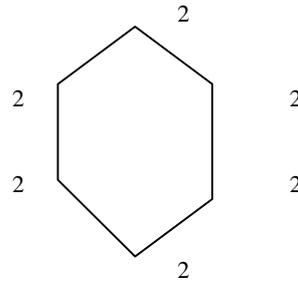
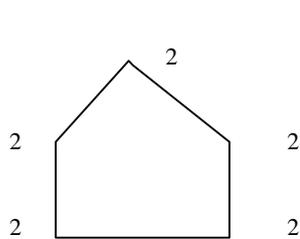
8 18



2.

2

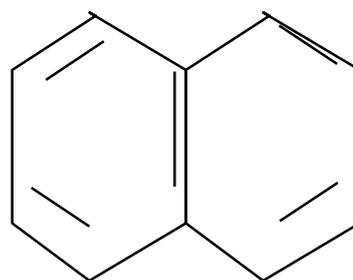
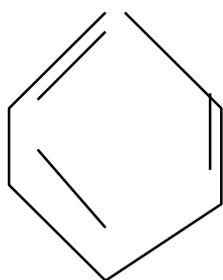
$C_nH_{2n}$



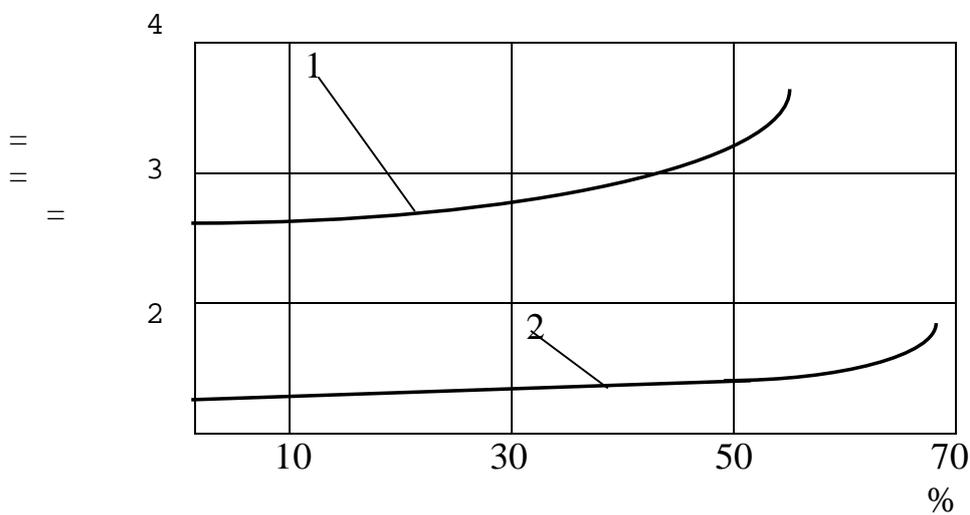
3. (70%)

:  $C_nH_{2n-6}$ ,  $C_nH_{2n-12}$

(5-20%)



6 6 ,

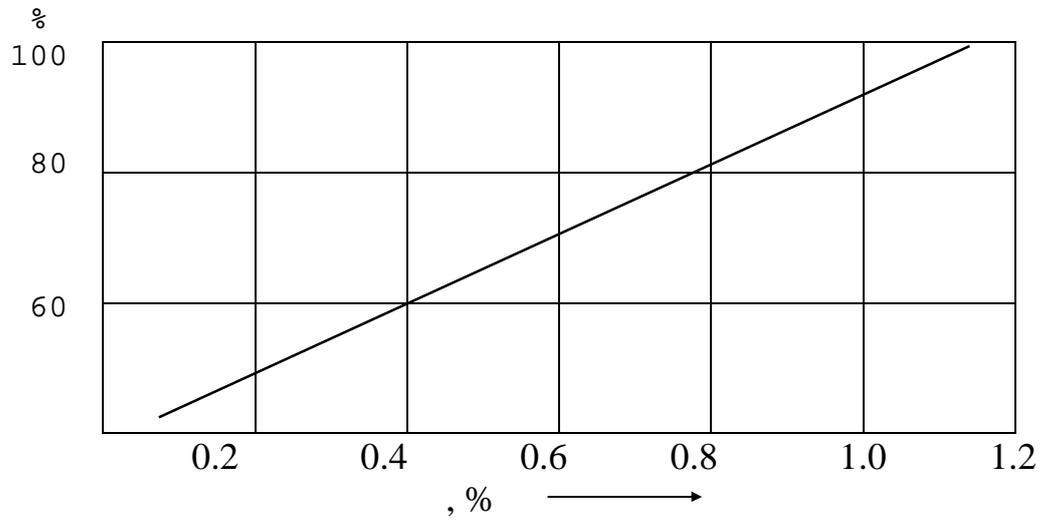


1- .

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2- .





( \_\_\_\_\_ ) . 10 % (0.1-1.3).

\_\_\_\_\_ , - (0.3 %)

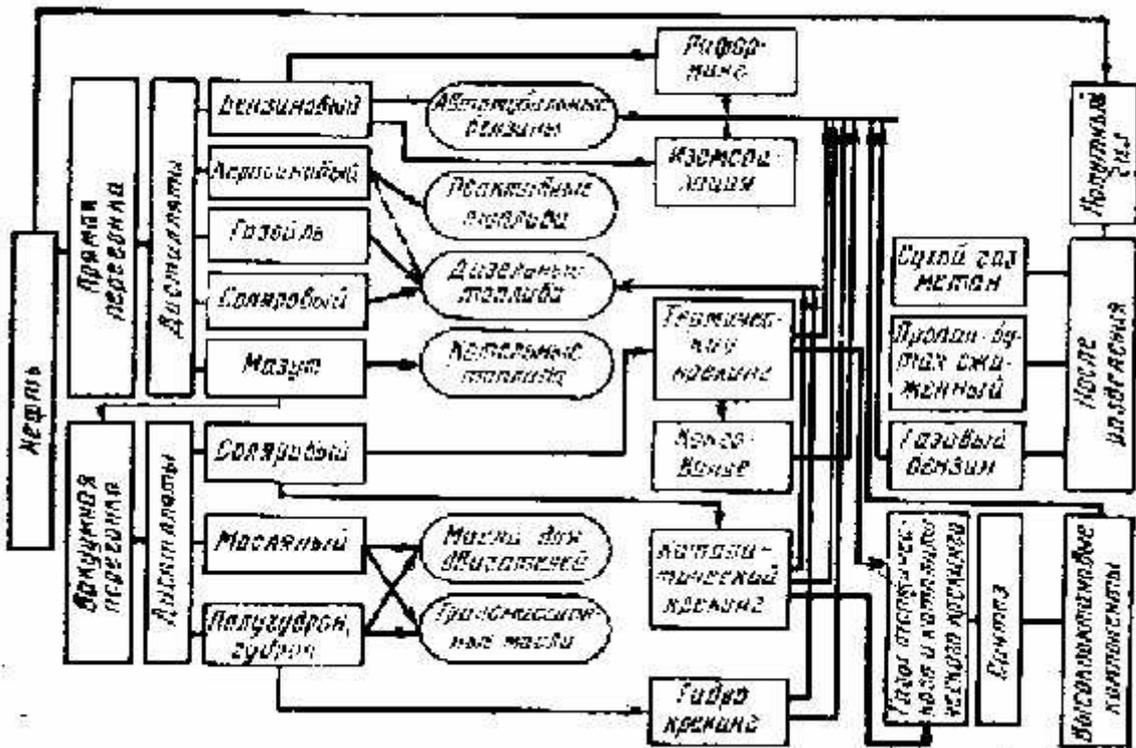
( )

300-350<sup>0</sup>

2

320-350<sup>0</sup>

40



2-

( 40-50).

20-30%

2

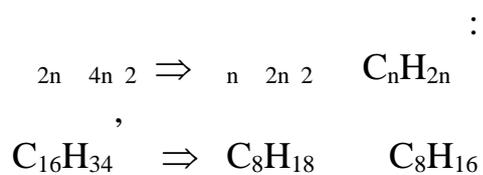
2

1) ( ).

2)

- : -  
- (500 ) ; 2 470-540° 2-7  
- :  
450-500° ( ), 0,06-0,14 ,  
(450° ).

8-15%

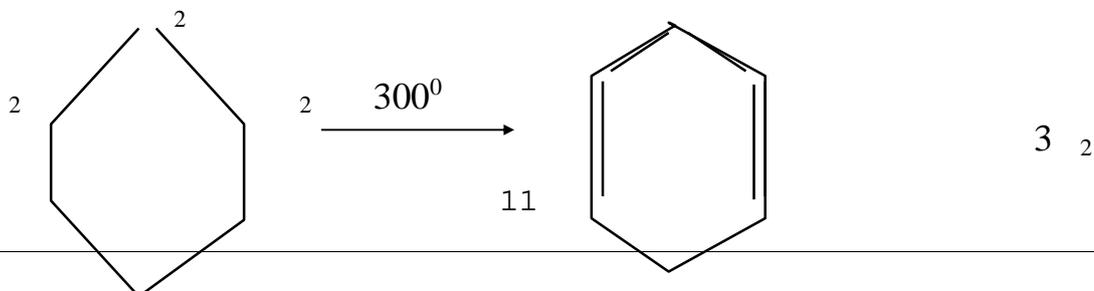


. 30-40% (68-70)

( 72-82)

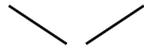
2 :

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(480° -520° , 3 )



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1,0-1,3%

0,02-0,06%

97-98%

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170-360°

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, 35-200°

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100

10, 50, 90%

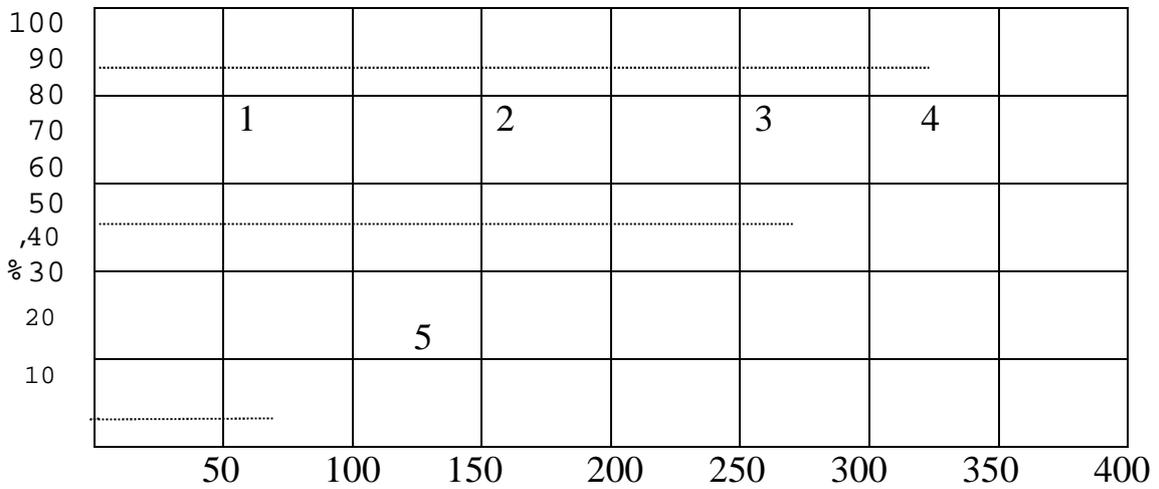
96%

).

(

50

3



3-

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1-1.5

900

( )

1500-2400<sup>0</sup>

(II)-

21%

N<sub>2</sub>

0.09-1.15

1.20-1.60

1.50-1.70

1.50-2.00

1.10-1.20

1.05-1.15

$1^3$  ,  $-1$   
 $( )$  ,  $-1$   $( )$   $1$   
 $1000$   
 $( )$  ,  $( )$   
 $( )$  ,  $1$   $4.1868$  ;  $1$   $4.1868$  ,  $( )$   
 $( )$  ,  $( )$   
 $Q$   $10200 \div 10500$   $42500 \div 43800$  ,

		( , )	( , )
	14.8	43961 (10500)	2780 (664)
	14.9	44380 (10600)	2788 (666)
	14.4	42700 (1020)	2771 (662)
	8.4	25958 (6200)	2763 (660)
	13.2	39356 (9400)	2771 (662)

$\alpha$   $0.45 \div 0.5$   
 $\alpha$   $1.35 \div 1.40$



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- 1.
- 2.
- 3.
- 4.
- 5.

85%

, 15%

0,712-0,742

<sup>3</sup>,

3200

<sup>3</sup>.

(400

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1)

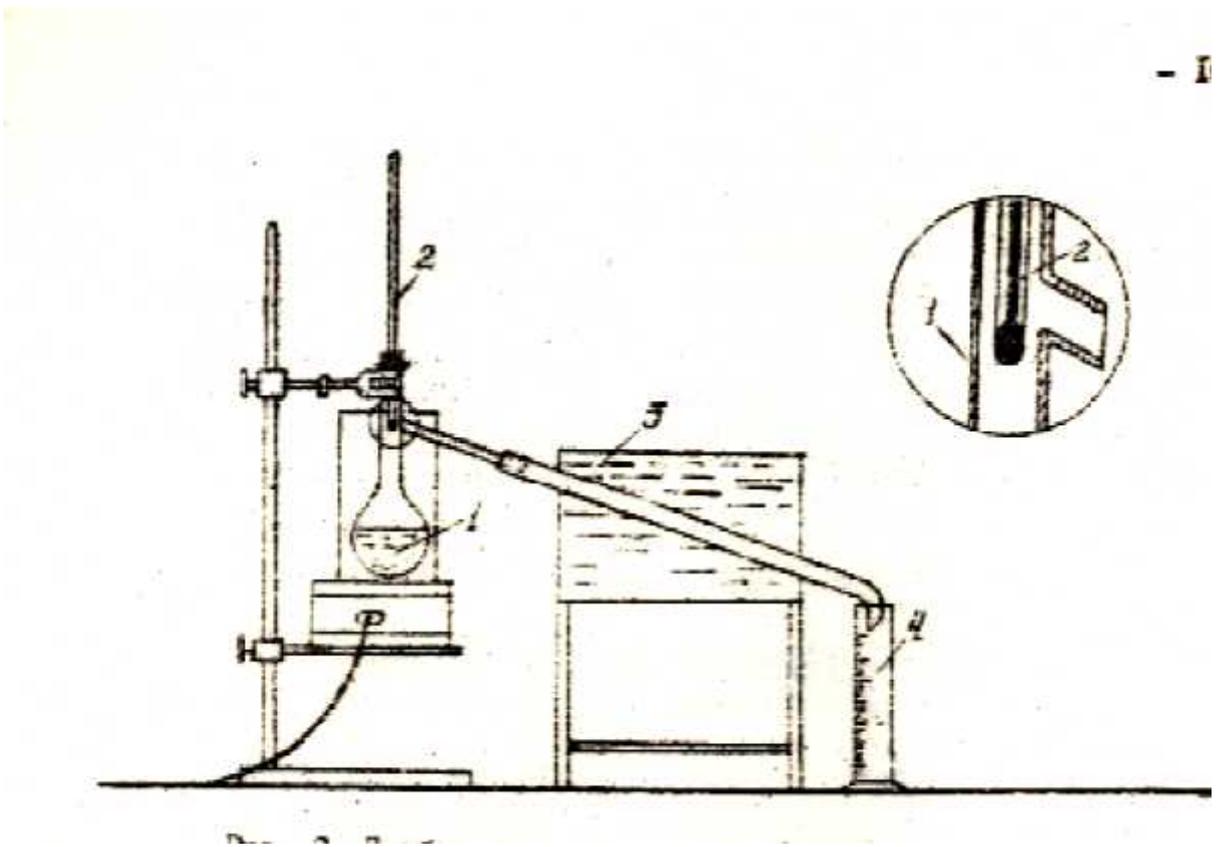
2)

3)

4)

5)

6)



- I

- 4-
- 1-
- 2-
- 3-
- 4-

40°  
10%

165-205°  
(t<sub>10</sub>)

30-

10%

$$: t \approx \frac{1}{2} t_{10\%} - 50.$$

7,0

70°

50%

60%

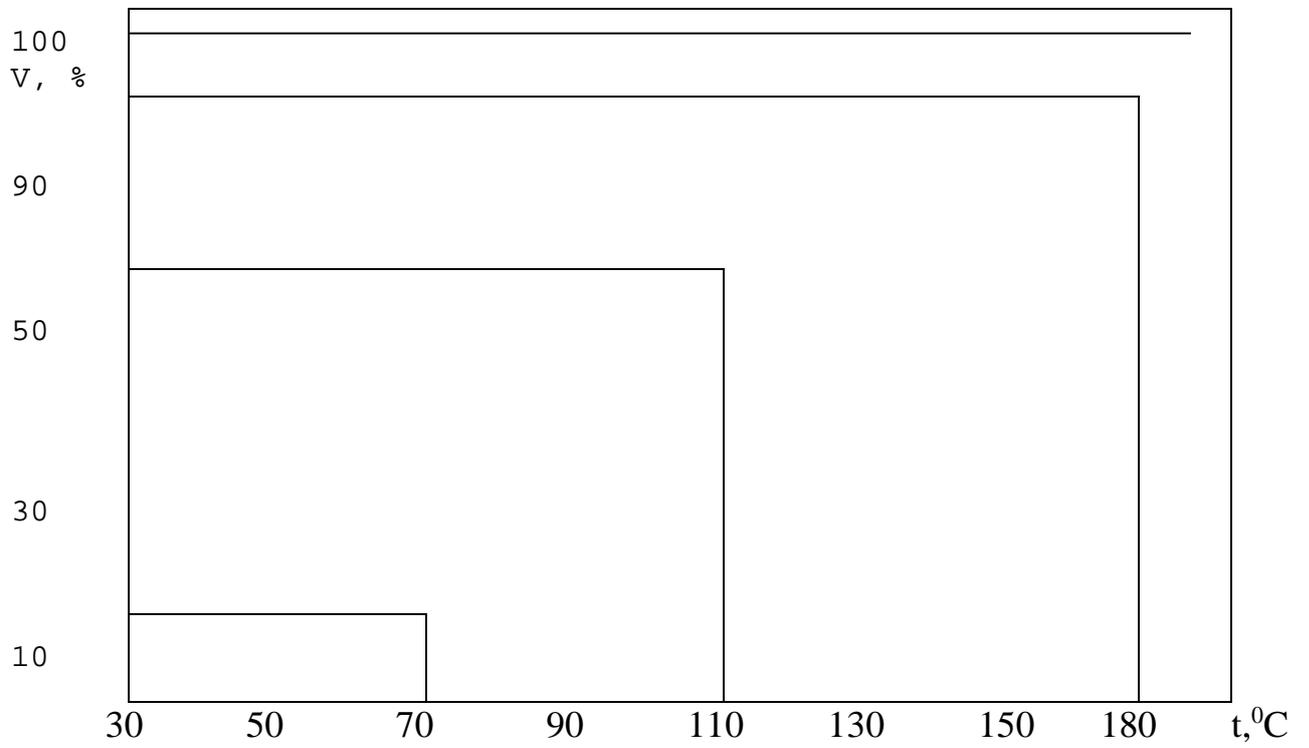
, 230°

150%

100%

205°

, 160°

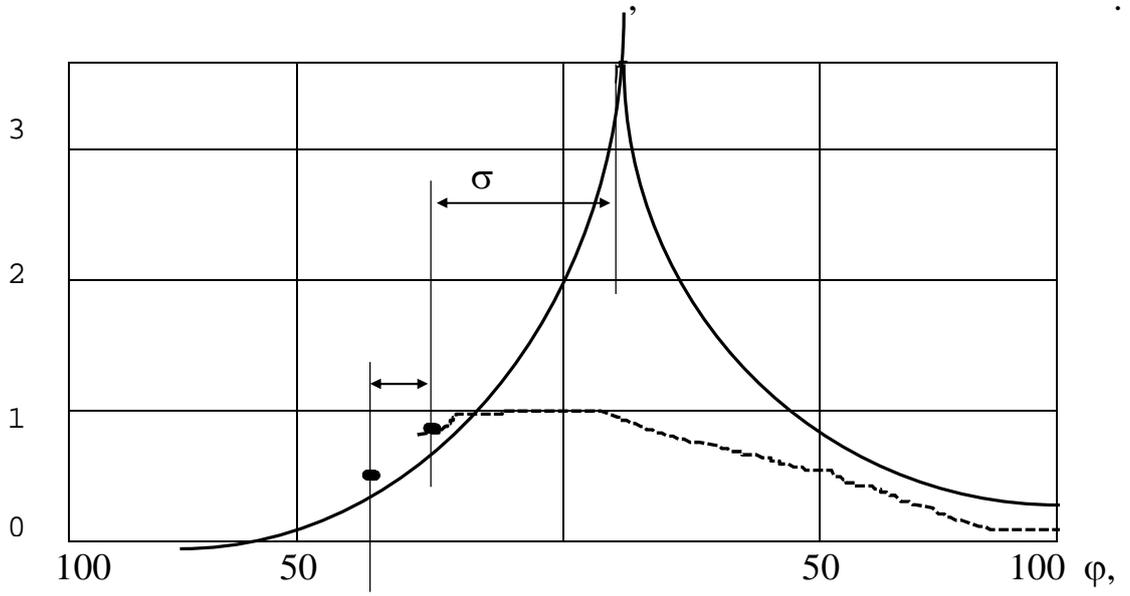


5-

( ) . , 10% 95% , 10% 70° , 50° 180° 160° 196-205° , 50% 185-195° 90% ( ) , - ( ) . ,

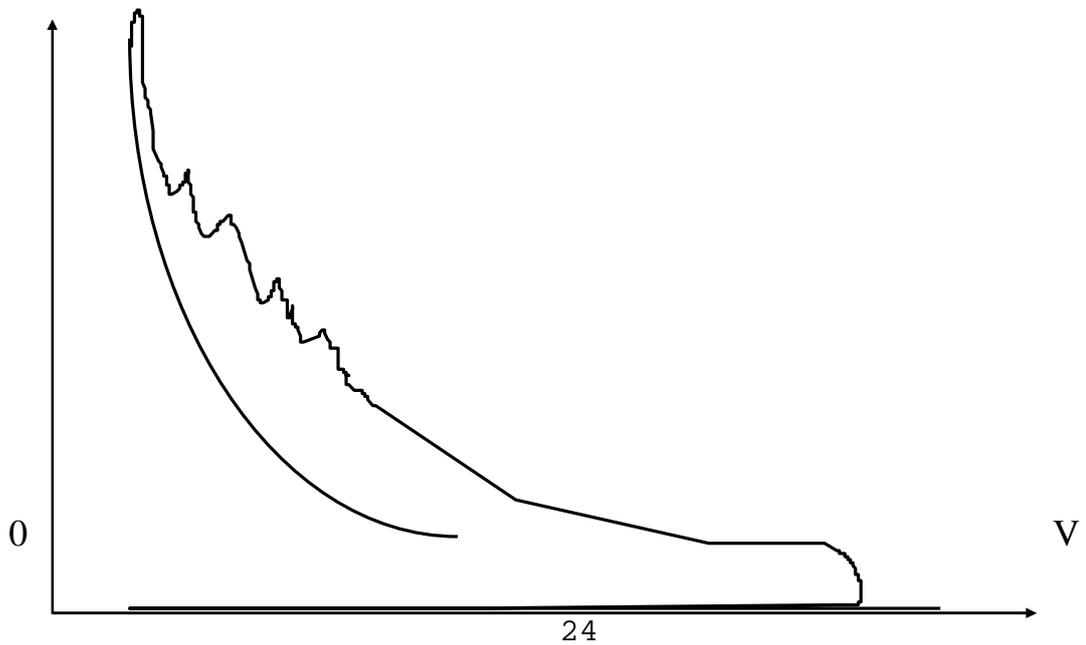
(6- ) .

15-30

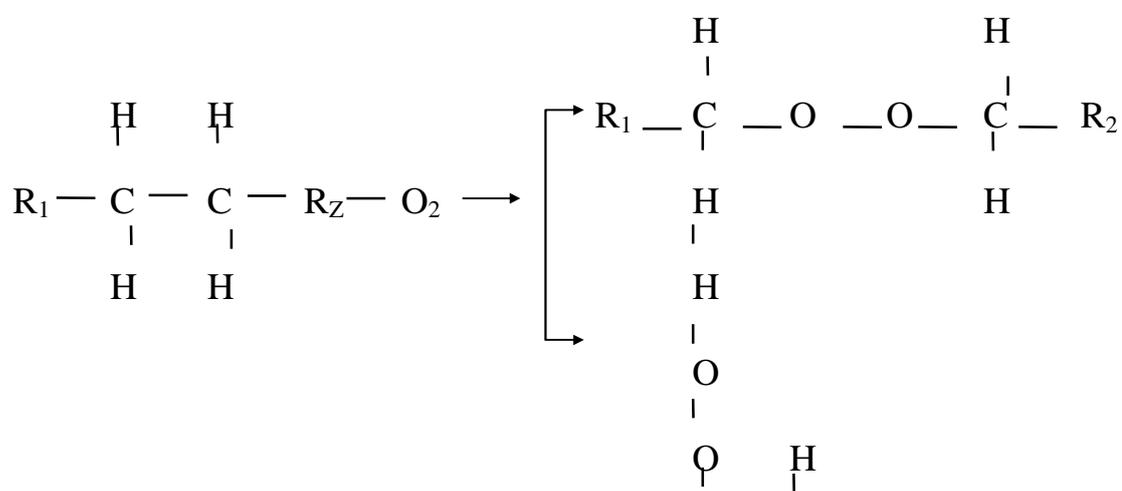


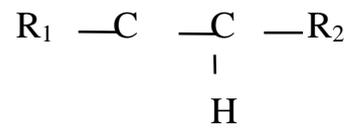
6-

( ) , (1500-2000 )  
( ) (7- ) .



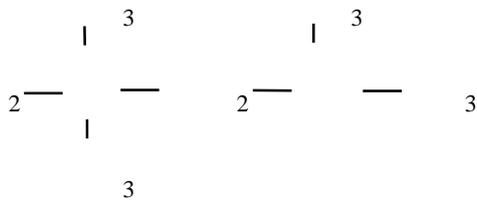
7-





- ( )
- 1) ( ) - 511-66, 9-2
- 2) ( ) - 8226-66, 9-2

- ( )
- 1) - 8 18 100



- 2) - 7 16 -
- 2- 2- 2- 3- 3- 2- 2-
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- 1) - ( )
- 2) - ( 2 4)4



( )

( ) , . ,

( ) , 15-20 % 28<sup>0</sup>

. , -93 ,

Mn 2 5 ( - ) , 50

70%

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, 5-8 ,

( 80 25-35 40

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, , 2,7 , 0,003 0,1% 0,2%

0,15 , -72 0,05 -66 -98 0,12% 0,1%

0,1 1,0

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667

667-933

( -72, -95)

( -93, -98)

( -70

)

95 130, -100 130).

( -91 115, -

0,2-0,25

		97...98	-
		88...92	82...87
		90	82
		80	73
		100	90...93
		97	91
		94	86
		90	84...86
		98...99	88...92
		85...88	82...84

		96...102	86...94
		90...96	82...90
		91...93	82...85
		97...99	87...88
		89...91	80...83
		98...99	88...89
		91...93	84...86

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3,0÷5,0

$\varepsilon$  16÷20.  
600-800<sup>0</sup>

( 20-25<sup>0</sup> ) 0,001-0,004

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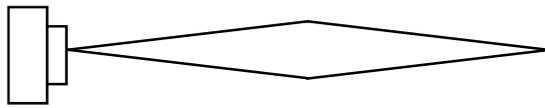
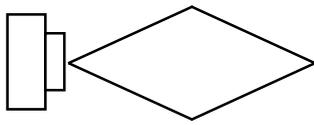
; 0,5% 87% , 15%  
0,78-0,86 % 3, 42,5  
25-30% 600

1. ( ) ;
2. ( ) ;
3. « » ;
4. ( ) , ;
5. ( ) ;
6. ( ) ;

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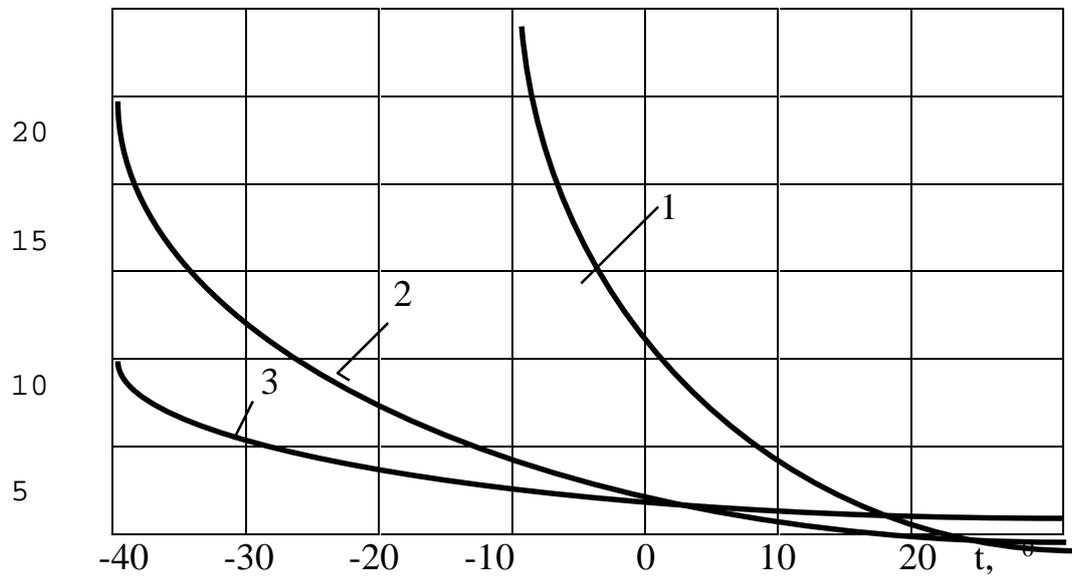
96%, 170-200<sup>0</sup> ; 50% 250<sup>0</sup> , 280<sup>0</sup> ,  
330-360<sup>0</sup> ,





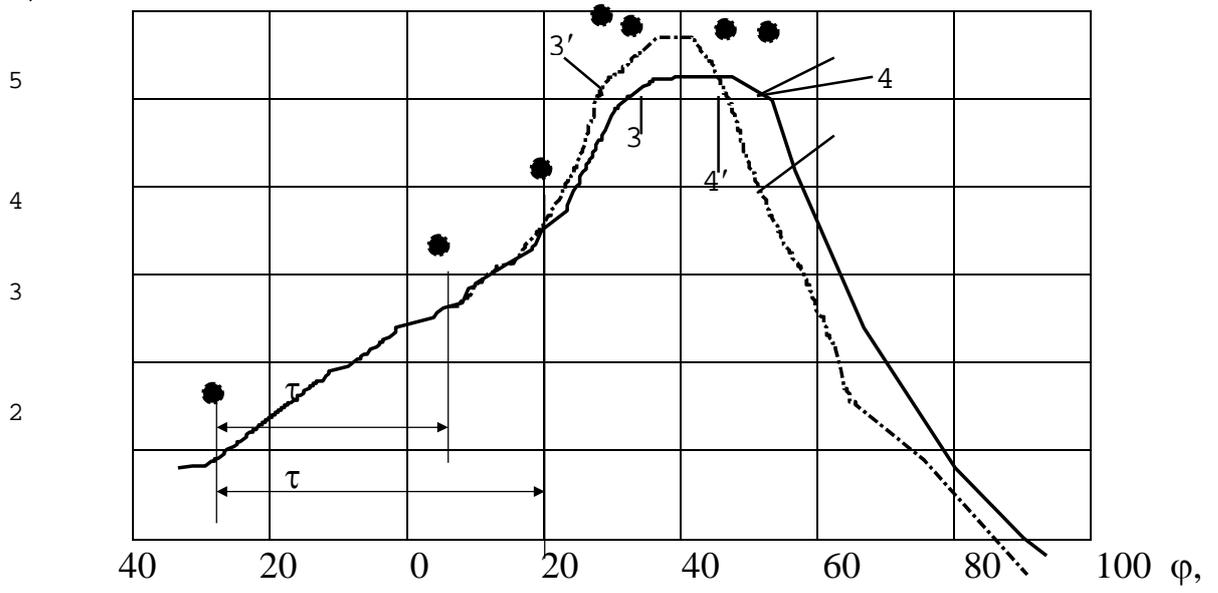
( )

$v$   
2/



8-  $v$ ,  $-t^{\circ}\text{C}$

1- ; 2- ; 3-



9-

10-15%

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$\tau$  -

(70%)

2-

2-  
3-

(20%)

(3 -4 )

4-

(9-

1000

( )

(9-

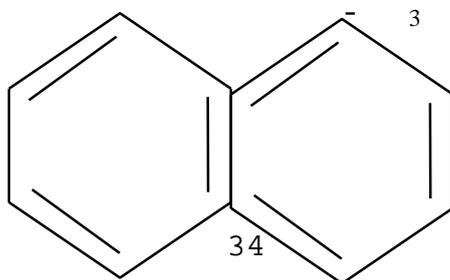
2- 3) -

16 34 (

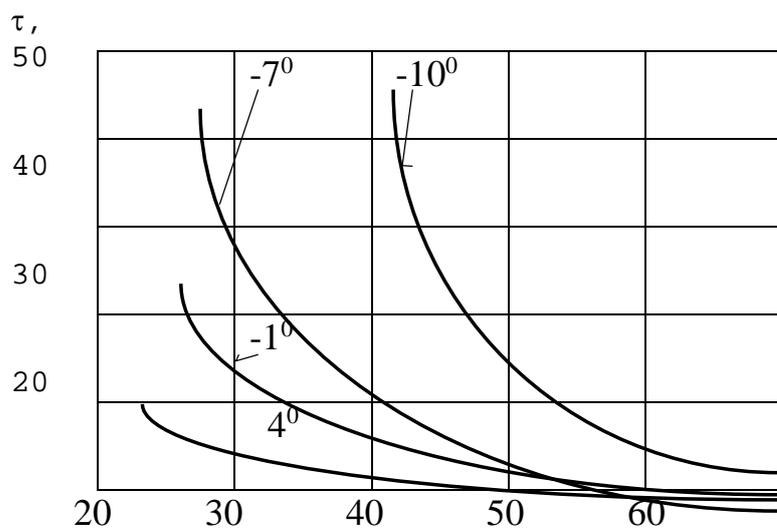
3- 2- 2-....

100

10 7 3

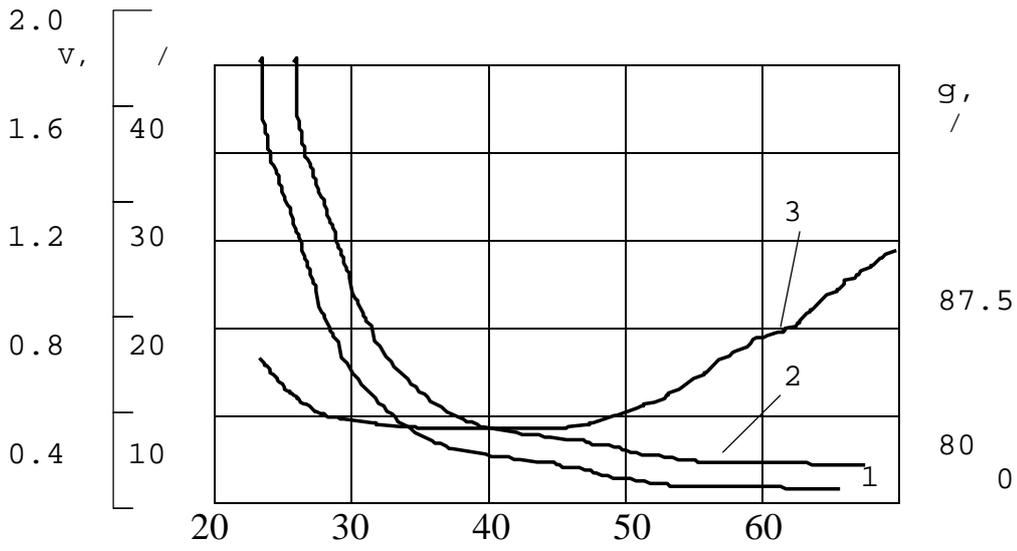


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 (7 -23 )



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1%  
10-12



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( 20000 3 5000 3 )

(1,6 )

(80% ) (20%)

- 46

0,524 3 (20<sup>0</sup> )  
2400 3

1,6

-53  
8,5.

6,7

, -130

6,5%  
8;

, -138  
-  
-53-07

(5-7%)

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20±5%

6%

80±5%

30°

0,07

. 45°

1,6

0,015%



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(90%

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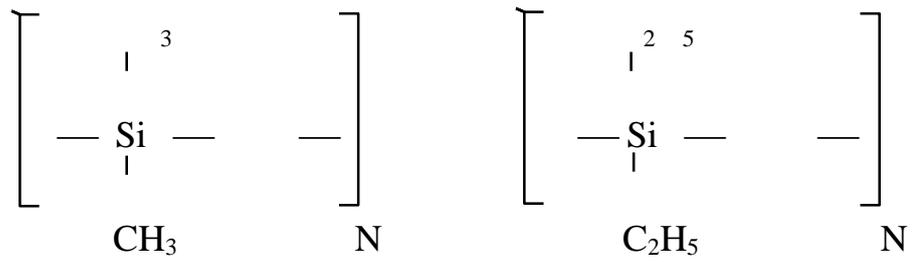
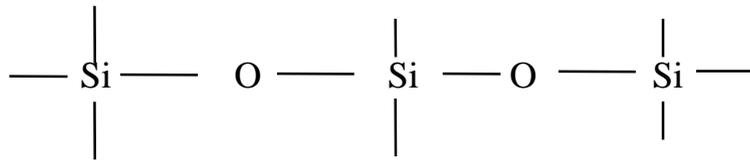
- 1) 15-18 %
- 2) 3%
- 3) 1%
- 4) 3-10%
- 5)
- 6)
- 7)
- 1 -



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 - ( 130 - 150° );  
 - ( 30 - 40° ).  
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 150° , , .  
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( , )



7.2.

( 100<sup>0</sup> 250 -300<sup>0</sup> ), 3-5 .

30÷40% (4-5% ).

( 30-40% ).

(300<sup>0</sup> ) , .

150<sup>0</sup>

7.2

			-	-	-
100 <sup>0</sup> 2	2.5	3.2	3.2	3.5	-
	70	140-150	135-180	270	500
, <sup>0</sup>	-40...-73	-43-...-63	-58....-63	-63...100	-3.....-23
0	119	232	193	315	400-500
, <sup>0</sup>	220	220	260-300	250	-
100 22 , %	8	0.1	0.1	0.1	0

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- 4.

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6-3

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100<sup>0</sup>

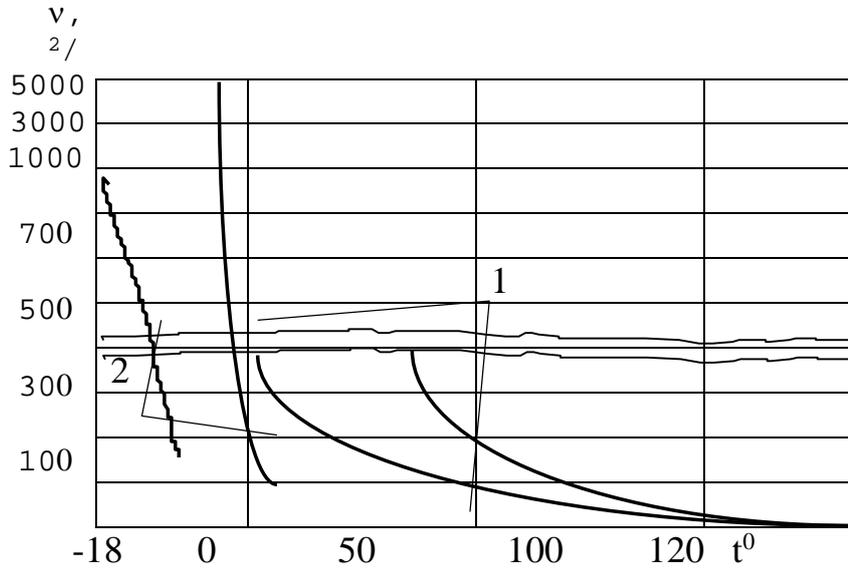
6-14

2

20<sup>0</sup>

10-14

2



12-

1-

-90.

2-

-140

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20<sup>0</sup>

25

30<sup>0</sup>

15<sup>0</sup>

45<sup>0</sup>

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20

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0,15%

\_\_\_\_\_ ( ) .

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15-20<sup>0</sup>

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(1 )  
(2 )

( )  
( )

100<sup>0</sup>  
: 6, 8, 10, 12, 14,

16 20<sup>2</sup> .

\_\_\_\_\_

- ,  
- , - 6-16%

- , ,  
- , 15-18%

-10 2 - 100<sup>0</sup> 10

(2)

100<sup>0</sup> 8 10-12 ; 100<sup>0</sup>

100<sup>0</sup> 6-8 8-10 ; 100<sup>0</sup>

14%

2

: -10<sup>2</sup> -8<sup>2</sup>  
- 10<sup>0</sup>

, -4 8<sup>2</sup>, 4 - (-18<sup>0</sup> 2600  
) , “ ” -

: , -24,  
1 -6 10<sup>1</sup> ( -8<sup>1</sup> -12<sup>1</sup>)  
1-

-8 , -10 , -12  
( )  
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SAE J 300 «  
» 100<sup>0</sup>  
: SAE 20, SAE 30, SAE 40, SAE  
50.  
: SAE 0W, SAE 5W, SAE 10W,  
SAE15W, SAE20W.  
: SAE  
10W 40, SAE 15W 50, SAE 20W 50, SAE 15W 40.  
, SAE

J  
: SA, SB, SC, SD, SE,  
SG, SH, SJ.



PS

1994

SJ -

1996

SG -

APJ

CA -

1940 1950

CB -

1949

-

1961

D -

1995

- 1983

CF -4

. CF-4

CF-2 -

D

1996

-6

F-4

F-4

SAE 15W-40

, ) SAE APJ ( ;  
, ) SAE ( ;  
W ,  
SAE 10  
: W, 5W, 10W, 15W, 20W.  
: 20, 30,40, 50.

10W-40.

APJ ( )  
(S- , C-  
( , , ,D,F,E,G,H). SA 70  
. SH D (1989 ).

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( ), -30<sup>0</sup>  
( )  
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1,2-1,4

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5-10%

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4.

10-15%

900-935

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1500-200

4000

(80-100°).

(2,5-3,0

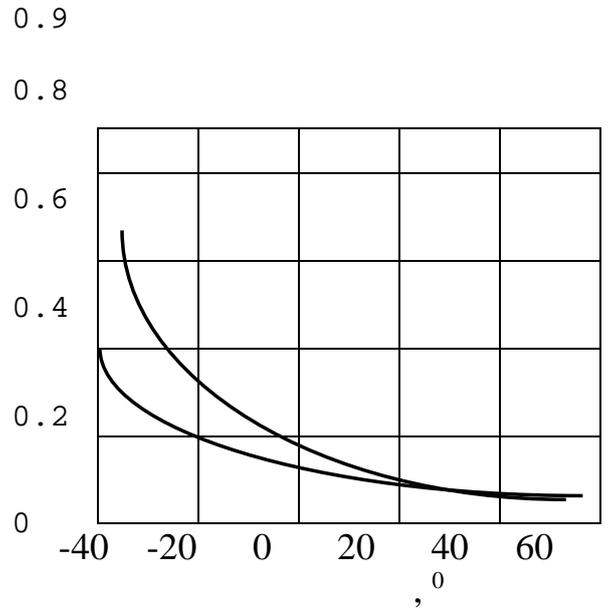
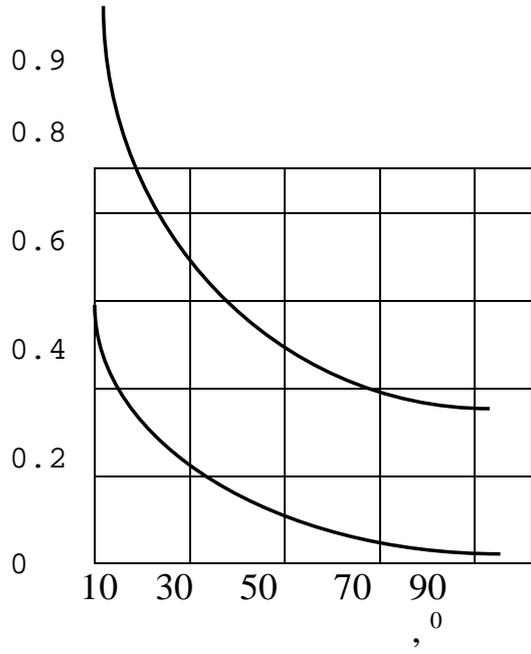
)

125-140°

250°

1-

( - )



13-

1000 , 90°

120°

2000

10-14

- ; 120° , 2000 ;

- ;

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100° 14-20 ,

( )

80-100° ,

150° 300-1000°

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- 1)
- 2)
- 3)

1.

$100^0$  ,  $-10-10^2$  .

- 15 . “ ”

- 9 . “ »

2.

- 17 . “ ”

( )

- 15 . “ ”

“ ”

-15

1. -

: SAE J306 C (

2.

API ( )

: SAE-70W, 75W, 80W, 85W.

: SAE-70, 75, 80,85

: SAE

75W-90,80W-90, 85W-140

API

1. L-1 -

;

2. GL-2

3. GL-3

4. GL-4

5. GL-5

6. GL-6

stroil SAF -XI

SAE 75W-140, Api GL-5

stroil SMX-B

SAE 75W-30 Api GL-4

BMW

« ( ) »

( , 40-60 )

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1 3...1 4

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1.

2.

3.

4.

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( , )

( 158)



1.  $\frac{1}{2}$  ( ) -

$80^0$  ( )

2. -3, -3 : -1, 1-13, -2,

3. -24

-3 - -24  
-24 -201 -

158 - ( )

4. -4 -

100000

-4 -

-1 -

12

$45^0$

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- 3.
- 4.

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10

60-80<sup>0</sup>

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800-1000<sup>0</sup>  
- 30<sup>0</sup> ÷ 40<sup>0</sup>

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1)

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2)  
(  
20-30° )

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“ ”  
-60° 90° -10  
-50° 90° , 50° 10

1.

, , 190-200°

2.

, -40°

3.

(

-22, -22

, , -60°

-22, -22

, , “ ”  
-60° , 190°

-22, -22

50% 50% ,  
 . ( )  
 118<sup>0</sup> , 20<sup>0</sup>  
 ;  
 : 50% 50%  
 ;  
 : 60% 40% ;  
 -25<sup>0</sup> 70<sup>0</sup> .  
 78<sup>0</sup> .  
 :  
 (1:1 20<sup>0</sup>)  
 .  
 ( 115<sup>0</sup> ) (1:1 )  
 .  
 . « » -22  
 ( ) .  
 « »  
 , , , « »  
 . 50 190<sup>0</sup> 50<sup>0</sup> ,  
 -60<sup>0</sup> .  
 « » , -3102 « »), ( « » , -114, -  
 4104 ,  
 -968 « »; ( ) ; « » -2136, -2137, -  
 2138, -2140, -2733, -2734 ; « » ; -260  
 ( ) ; -52-04, -  
 53 , -53-12 , -672

(130-150°).  
« » 260°

205°

« »

-63° , 50°

10

-12

-12

- 50

60°

-10

3.

20 50

“ -40”

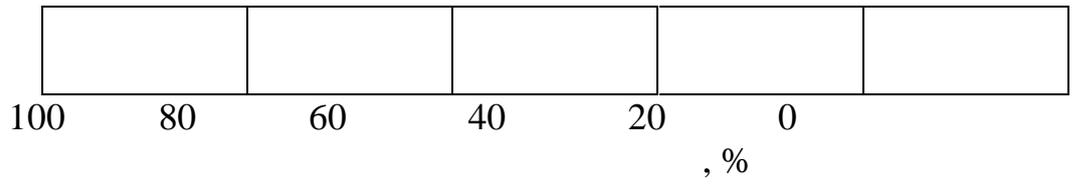
4.

85-90° ,

105-110°

15-20°





14-

-40 - : 53-55% ,  
 -35<sup>0</sup> , -40 .  
 -65 - : 66% , 33% .

40, 40 , 65, 65

- 2.5-3.5

( ) 1 ,

, 6-8%

« » - -40 (8%) ..

-60 -

1:1 ,

-35 0

- 1.12-1.14 <sup>3</sup>

- -40 -1.075-1.085 <sup>3</sup>

- -65 -1.085-1.095 <sup>3</sup>

0,4%

:“

.».

**1.**

-

-

-

-

**2.**

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-

-

-

-

-

		100
-51	-72	21,5
-53	-76	25,5
-21 “ ”	-76	13,0
-24 “ ”	-93	13,0
	-93	10,5

( 100 )

( )	8,5
-2121 « »	12
-469, - 469	16
- 260, - 280	40,44
-51, -53	21,25
-5511	34

100 2 ., 1,3 ., 2,5 .  
(5% 20%)  
).





