

**. 9 . 2017/2018**

	<b>1.</b>				
01.			1,66·10 <sup>-24</sup>	( , . . )	
		3,58 .			
02.			3,32·10 <sup>-24</sup>	( , . . )	
		3,58 .	-		
03.				4,98·10 <sup>-24</sup>	( , . . )
			2,68 .		
04.			6,64·10 <sup>-24</sup>	( , . . )	
			5,36 .		
05.			23,24·10 <sup>-24</sup>	( , . . )	
		25,0 .	-		
06.			26,56·10 <sup>-24</sup>	( , . . )	
				21,43 .	
07.			26,56·10 <sup>-24</sup>	( , . . )	
			28,58 .		
08.			31,54·10 <sup>-24</sup>	( , . . )	
		84,82 .	-		
09.			33,2·10 <sup>-24</sup>	( , . . )	
			26,8 .		
10.			36,52·10 <sup>-24</sup>	( , . . )	
		19,64 .			
	<b>2.</b>				
11.			+4,8·10 <sup>-19</sup>		
12.			+6,4·10 <sup>-19</sup>		
13.			+8,0·10 <sup>-19</sup>		
14.			+9,6·10 <sup>-19</sup>		
15.			+11,2·10 <sup>-19</sup>		

16.				+12,8·10 <sup>-19</sup>	.		,
17.				+14,4·10 <sup>-19</sup>	.		,
18.				+17,6·10 <sup>-19</sup>	.		,
19.				+19,2·10 <sup>-19</sup>	.		,
20.				+20,8·10 <sup>-19</sup>	.		,
<b>3.</b>							
21.					,		400
22.	12 % ( . )				.		.
23.	400	12 % ( . )			.		.
24.	400	12 % ( . )			.		.
25.	400	40 % ( . )			.		.
26.	400	40 % ( . )			.		.
27.	400	40 % ( . )			.		.
28.	400	40 % ( . )		10 %	.		,
29.	28 % ( . )				,		400
30.	400	56 % ( . )			.		.
<b>4.</b>							
31.					,	(VI),	
32.					,	(VI),	

33. , , (VI),  
.
34. , (III), (V),  
.
35. , , (V),  
.
36. , , (VI),  
.
37. , , (VII),  
.
38. , (III), (IV),  
.
39. , , (V),  
.
40. , (III), (V),  
.

**5.**

41.  
1. . 2. , . 3. . 4. . 5. . 6. .  
7. . 8. .
42.  
1. . 2. , . 3. . 4. . 5. . 6.  
. 7. . 8. .
43.  
1. . 2. , . 3. . 4. . 5. . 6. .  
7. . 8. .
44.  
1. . 2. , . 3. . 4. . 5. .  
6. . 7. . 8. .
45.  
1. . 2. , . 3. . 4. . 5. . 6. .  
7. . 8. .

46. 1. . 2. . 3. , . 4. . 5. . 6. . 7. .  
8. .

47. 1. . 2. . 3. , . 4. . 5. . 6.  
. 7. . 8. .

48. 1. . 2. . 3. , . 4. . 5. . 6. . 7.  
. 8. .

49. 1. . 2. . 3. , . 4. . 5. .  
6. . 7. . 8. .

50. 1. . 2. . 3. , . 4. . 5. . 6.  
. 7. . 8. .

## 6.

51. :  
1)  $2S + H_2O_2( ) =$  + 3)  $Na_2CO_3 + H_2O + CO_2 =$   
2)  $Fe + HBr =$  4)  $Al + H_2 =$

52. :  
1)  $Al + O_2 =$  3)  $MgCO_3 + HCl = CO_2 +$   
2)  $Fe_2O_3 + H_2 = Fe +$  4)  $N_2 + Li =$

53. :  
1)  $C + O_2 = CO$  3)  $NaOH( ) + CO_2 =$   
2)  $Cl_2 + Fe =$  4)  $CO_2 + Mg =$

54. :  
1)  $SO_2 + H_2S =$  2)  $NaOH + NO_2 =$   
3)  $CO + CuO =$  4)  $C + Cl_2 =$

55. :  
1)  $NO + O_2 =$  2)  $MgCO_3 + HBr = CO_2 +$   
3)  $N_2 + Cs =$  4)  $Ca + P =$

56. :  
1)  $Ca + O_2 =$  2)  $NaOH( ) + SO_2 =$   
3)  $CaCO_3 + CO_2 + H_2O =$  4)  $SiH_4 + O_2 = SiO_2 +$

57. :  
1)  $SO_2 + O_2 =$  2)  $Ba(OH)_2 + NO_2 =$   
3)  $HNO_3 + Fe_2O_3 =$  4)  $Cu + Cl_2 =$

58. O :  
1)  $CO + O_2 =$  4)  $KHCO_3 + HBr =$   
2)  $Ba + H_2O =$  5)  $O_3 + CH_4 =$

59. :  
 1)  $\text{CaH}_2 + \text{O}_2 = \text{CaO} + 2) \text{NaOH}(\quad) + \text{SO}_3 =$   
 3)  $\text{KOH} + \text{MgCl}_2 = 4) \text{SiH}_4 + \text{I}_2(\quad) =$

60. :  
 1)  $\text{SO}_2 + \text{Cl}_2 = 2) \text{Ba}(\text{OH})_2 + \text{CO}_2 =$   
 3)  $\text{H}_2\text{SO}_4 + \text{Fe}_2\text{O}_3 = 4) \text{KOH} + \text{Cl}_2 = (\quad)$

**7.**

61.	100	9,8 % ( . ) (%)	20
62.	100	25,2 % ( . ) (%)	20
63.	100	9,8 % ( . ) (%)	16,8
64.	100	9,8 % ( . ) (%)	10,6
65.	100	12,6 % ( . ) (%)	13,8
66.	100	25,6 % ( . ) (%)	10
67.	100	25,6 % ( . ) (%)	16,8
68.	100	16,2 % ( . ) (%)	7,4
69.	200	8,1 % ( . ) (%)	13,8
70.	100	7,3 % ( . ) (%)	20

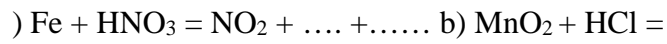
**8.**

71. -  
 )  $\text{Fe} + \text{HNO}_3 = \text{NO} + \dots + \dots$  b)  $\text{MnO}_2 + \text{HI} =$

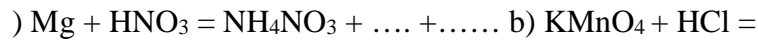
72. -  
 )  $\text{Fe} + \text{HNO}_3 = \text{N}_2\text{O} + \dots + \dots$  b)  $\text{MnO}_2 + \text{HBr} =$

73. -  
 )  $\text{Fe} + \text{HNO}_3 = \text{N}_2 + \dots + \dots$  b)  $\text{MnO}_2 + \text{H}_2\text{O}_2 + \text{H}_2\text{SO}_4 =$

74. -



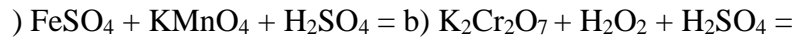
75. -



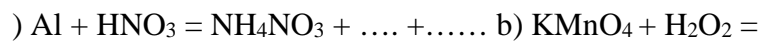
76. -



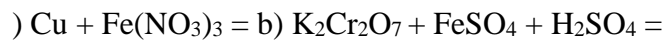
77. -



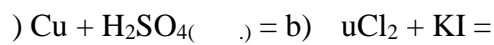
78. -



79. -



80. -



**9.**

81. 4,9 100 6 % ( ) 19,0

82. 50 ( $\omega = 7,3 \%$ ) 47,8 5 % ( ) 6,04

83. 4,38 47,8 5 % ( ) 8,57

84. 4,00 50 4 % ( ) 5,1

85. 50 ( $\omega = 19,6 \%$ ) 50 16% ( ) 16,1

86. 4,9 50 12 % ( ) 38,0

87.		1,15		0,224
( . . )		22		
			1,98	
88.		5,0		1,12 ( . . )
1,964 /		7,35		
89.		1,16		0,44
	22		1,99	
90.		0,843		0,224 ( . . )
1,964 /		2,465		
<b>10.</b>				
91.			6,35	
, , ω=10 % ( . )				112,2
			(%) . Cu=63,5 /	
92.			6,35	
, , ω=10 % ( . )				112,2
			(%) . Cu=63,5 /	
93.		(III)		28 .
200 ,			16,22%.	
		( )		
94.		(III)		28 .
400 ,			8,11%.	
( )				
95.		(III)		32 .
200 ,			8,11%.	
( )				
A <sub>Cu</sub> =63,5 /				
96.		(III)		32 .
400 ,			5,41 %.	
( )				
A <sub>Cu</sub> =63,5 /				
97.		(II)		3,27 .
126,8 ,			10,0 %.	
				( )
				. A <sub>Zn</sub> =65,4 /

98.	134,5 ,	(II)	10,0 %.	3,27 .
				( )
				. A <sub>Cu</sub> =63,5 / .
A <sub>Zn</sub> =65,4 /				
99.	126,8 ,	(II)	10,0 %.	3,27 .
100.	269,0 ,	(II)	20,0 %.	13,08 .
				( )
				. A <sub>Cu</sub> =63,5 / .
A <sub>Zn</sub> =65,4 /				





9

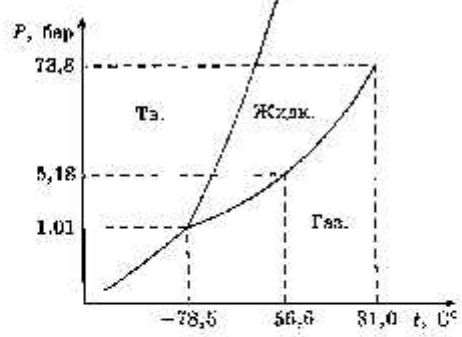
9.1.1.  $\text{KClO}_3 = \text{KCl} + 1,5\text{O}_2$  (KClO<sub>3</sub> + C) 1,5  
 -394 / -48 / KClO<sub>3</sub>.  
 ( ) 100

9.1.2.  $\text{H}_2\text{S} = \text{H}_2 + \text{S}$  420 30 8000

9.1.3.  $\text{N}_2\text{O}_4$   $G^0_{298}$  :  
 (1)  $0,5\text{N}_2 + 0,5\text{O}_2 = \text{NO}$   $G^0_{298} = 90374$   
 (2)  $\text{NO} + 0,5\text{O}_2 = \text{NO}_2$   $G^0_{298} = -38535$   
 (3)  $2\text{NO}_2 = \text{N}_2\text{O}_4$   $G^0_{298} = -5397$

9.1.4.  $\text{N}_2\text{O}_4 = 2 \text{NO}_2$  63° 1,27.  
 : 1) 1 , 2) 10

9.1.5. 1. ?  
 2. =300 =12 ; =270 =1,0 ?



3. 2 4 10°  
 :  
 ,  
 ( )

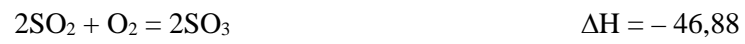
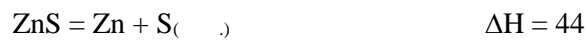


9

9.2.1  $6 \times 10 \times 4^{-3}$

–  $25^\circ$  750 . .

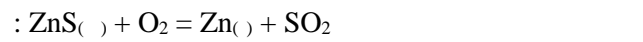
9.2.2.  $ZnSO_4$ .



9.2.3. 12 290 233 , 1 60 .

29,13 / . .

9.2.4.



9.2.5 Fe-Mo, 40 % , 3

, 0,1?

		$\Delta H_{298}^{\circ}$ , /	$S_{298}^{\circ}$ , /( $\ddot{\text{u}}$ )	$C_P = a + b\ddot{\text{u}}T + c\ddot{\text{u}}T^{-2}$ , /( $\ddot{\text{u}}$ )		
				a	$b\ddot{\text{u}}10^3$	$c\ddot{\text{u}}10^{-5}$
C	s	0	5,74	16,86	4,77	-8,54
CH <sub>4</sub>	g	-74600	186,26	42,06	31,50	-17,29
CO	g	-110530	197,55	28,41	4,10	-0,46
CO <sub>2</sub>	g	-393510	213,66	44,14	9,04	-8,54
COCl <sub>2</sub>	g	-223000	289,20	67,16	12,11	-9,03
COS	g	-141700	231,54	48,12	8,45	-8,20
CS	g	279780	210,45	33,70	2,04	-4,57
CS <sub>2</sub>	g	116700	237,77	52,09	6,69	-7,53
Cl <sub>2</sub>	g	0	223,0	36,69	1,05	-2,52
Co	s	0	30,04	7,69	30,25	9,06
CoO	s	-238900	52,93	48,28	8,54	1,67
Fe	s	0	27,15	-16,64	69,15	21,95
FeO	s	-264850	60,75	50,80	8,61	-3,31
H <sub>2</sub>	g	0	130,52	27,28	3,26	0,50
H <sub>2</sub> O	g	-241810	188,72	30,00	10,71	0,33
H <sub>2</sub> S	g	-20600	205,69	29,37	15,40	0,00
HCl	g	-92300	186,70	26,53	4,60	1,09
Mn	s	0	32,01	27,41	10,01	-3,79
MnO	s	-385100	61,50	46,48	8,12	-3,68
Ni	s	0	29,87	34,06	-0,92	-7,21
NiO	s	-239740	37,99	63,17	-6,53	-13,55
O <sub>2</sub>	g	0	205,03	31,46	3,39	-3,77
Pb	g	195200	175,26	20,80	0,00	0,00
PbO	s	-218100	68,70	47,09	11,44	-4,03
S <sub>2</sub>	g	128600	228,06	36,11	1,09	-3,51
SO <sub>2</sub>	g	-296710	248,11	49,76	4,71	-10,06
SO <sub>2</sub> Cl <sub>2</sub>	g	-358700	311,30	53,72	79,50	0,00
SO <sub>3</sub>	g	-395200	256,23	57,32	26,86	-13,05
Zn	g	130500	160,90	20,79	0,00	0,00
ZnO	s	-348110	43,51	48,99	5,10	-9,12
ZnS	s	-205360	57,69	49,25	5,27	-4,85