



<p>H = 1, C = 12, N = 14, O = 16, F = 19, Na = 23, Al = 27, P = 31, :  S = 32, Cl = 35.5, K = 39.1, Ca = 40.1, Fe = 56, Cu = 63.5, Br = 79.9  <math>N_A = 6.02 \times 10^{23}</math>, <math>R = 0.0821 \text{ atm L mol}^{-1} \text{ K}^{-1} = 8.314 \text{ J mol}^{-1} \text{ K}^{-1}</math> :</p>
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(m s<sup>-1</sup>) (mol) (kg) (J) ( ) -1

( °C ( K ( F ( ) -2

( ) ( ) ( ) ( ) ( ) C = mp -3

3RT/M ( CΔT ( nRT ( (q) m/n ( ) -4

: 27°C H<sub>2</sub> CO<sub>2</sub> 1 mol ( ) -5

.H<sub>2</sub> CO<sub>2</sub> ( ) ( )

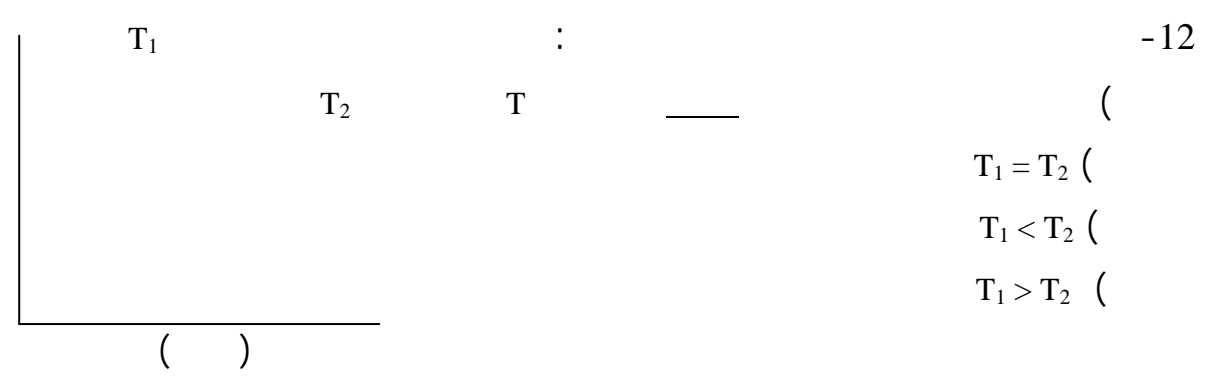
: PΔV ( Δn<sub>g</sub>RT ( ΔH ( ΔU ( ) -6

:  $\frac{PV}{RT}$  ( ) ( ) -7

. ( . (   
 : (J) -8   
 $\text{kg m}^2 \text{s}^{-1}$  (  $\text{kg m s}^2$  (  $\text{kg m}^{-1} \text{s}^{-2}$  (  $\text{kg m}^2 \text{s}^{-2}$  (

. P, T ( . ( :R -9   
 . ( .PV (   
 : -10   
 V, T ( P, V ( P, T ( n, V (

$A + B \rightarrow \frac{1}{2} C \quad \Delta H = -25 \text{ kJ}$  : -11   
 $.75 \text{ kJ}$  (C)   
 1.5 ( 2 ( 1 ( 0.5 (



-20 J 30 J -13   
 :  $\Delta U$    
 60 ( 20 ( 10 ( 40 (

: 5.38 g  $\text{C}_6\text{H}_{12}\text{O}_6$  -14   
 $8.2 \times 10^{22}$  (  $3.6 \times 10^{22}$  (  $3.6 \times 10^{24}$  (  $1.8 \times 10^{22}$  (

:  $\text{Al}_2(\text{SO}_4)_3$   $2.5 \times 10^{-3}$  -15   
 0.121 g ( 0.427 ( 0.375 ( 0.855 g (

14.6% P, 55.3% K, 30.1% O : -16

			:				
	K <sub>4</sub> PO <sub>3</sub> (	KPO <sub>5</sub> (		K <sub>2</sub> PO <sub>4</sub> (	K <sub>3</sub> PO <sub>4</sub> (		
		:	C <sub>2</sub> HBrClF <sub>3</sub>	(F)		-17	
	35.5% (	17.9% (		30.8% (	28.9% (		
	2NaOH(s) + CO <sub>2</sub> (g) → Na <sub>2</sub> CO <sub>3</sub> (s) + H <sub>2</sub> O(l)					:	-18
	Na <sub>2</sub> CO <sub>3</sub>	CO <sub>2</sub>	1.0 mol	NaOH	1.7 mol		
					:		
	0.1 mol (	0.43 mol (		1 mol (	0.85 mol (		
				:(	)	-19	
	C <sub>3</sub> H <sub>6</sub> (g) + O <sub>2</sub> (g) → CO <sub>2</sub> (g) + H <sub>2</sub> O(g)						
		:	C <sub>3</sub> H <sub>6</sub>	CO <sub>2</sub>			
	5:2 (	3:7 (		1:2 (	2:6 (		
	N <sub>2</sub> (g) + 3H <sub>2</sub> (g) → 2NH <sub>3</sub> (g)					:	-20
	:		5×10 <sup>2</sup> H <sub>2</sub>	N <sub>2</sub>	1×10 <sup>3</sup> g		
	285.8 g (N <sub>2</sub> ) (	285.8 g (H <sub>2</sub> ) (	142.9 g (N <sub>2</sub> ) (	142.9 g (H <sub>2</sub> ) (			
100 ml		0.5 M			CH <sub>3</sub> OH	-21	
					:		
	0.1 (	0.05 g (		0.8 g (	1.6 g (		
	H <sub>2</sub> C <sub>2</sub> O <sub>4</sub> (s) + 2NaOH(aq) → Na <sub>2</sub> C <sub>2</sub> O <sub>4</sub> (aq) + 2H <sub>2</sub> O					:	-22
	NaOH	50.00 ml	(	) H <sub>2</sub> C <sub>2</sub> O <sub>4</sub>	0.30 g		
			:	NaOH			
	(	2.50 g (		0.60 M (	0.13 M (		
	(0.8980 g/ml)	(14.8 M)		NH <sub>3</sub>		-23	
				:			
	0.146 (	0.354 (		0.708 (	0.292 (		
				:		-24	

.T V ( )  
 O<sub>2</sub> N<sub>2</sub> ( )  
 b ( )  
 ( )

25°C 0.136 atm 1.74 L -25  
 1.8 mol ( ) 1.1 mol ( ) 9 mol ( ) 9.67×10<sup>-3</sup> mol ( )

2X + Y → 3Z : -26  
 : kJ mol<sup>-1</sup> ΔH<sub>f</sub><sup>o</sup>

Z = 20 Y = 15 X = 10  
 : ΔH<sub>f</sub><sup>o</sup>  
 100 ( ) 40 ( ) 25 ( ) 30 ( )

: -27

- a. C(s) + 2H<sub>2</sub>(g) → CH<sub>4</sub>(g) ΔH<sub>f</sub><sup>o</sup> = -75 kJ mol<sup>-1</sup>  
 b. C(s) → C(g) ΔH<sub>f</sub><sup>o</sup> = 717 kJ mol<sup>-1</sup>  
 c. ½ H<sub>2</sub>(g) → H(g) ΔH<sub>f</sub><sup>o</sup> = 218 kJ mol<sup>-1</sup>

:kJ mol<sup>-1</sup> ΔH<sup>o</sup>  
 CH<sub>4</sub>(g) → C(g) + 4H(g)  
 1225 ( ) 3005 ( ) 2675 ( ) 1664 ( )

0.1 mol -28

P<sub>H<sub>2</sub>O</sub> = 24 Torr (745 Torr) 2.5 L

721 Torr ( ) 769 Torr ( ) 24 Torr ( ) 745 Torr ( )

: -29

400 ( ) 389 ( ) 289 ( ) 300 ( )

N<sub>2</sub> 93.5% -30

17 ( ) 32 ( ) 136 ( ) 44 ( )

<b>10</b>	<b>9</b>	<b>8</b>	<b>7</b>	<b>6</b>	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>	
<b>20</b>	<b>19</b>	<b>18</b>	<b>17</b>	<b>16</b>	<b>15</b>	<b>14</b>	<b>13</b>	<b>12</b>	<b>11</b>	
<b>30</b>	<b>29</b>	<b>28</b>	<b>27</b>	<b>26</b>	<b>25</b>	<b>24</b>	<b>23</b>	<b>22</b>	<b>21</b>	