CHEMISTRY

BOOKS - SAI CHEMISTRY (TELUGU ENGLISH)

THERMODYNAMICS

Mcqs

1. Which of one following is applicable is applicable for an adiabatic expansion of an ideal gas?

A. ΔE=0

B. $\Delta W - \Delta E$

C. $\Delta W = -\Delta E$

D. $\Delta W=0$

Answer: C

Watch Video Solution

2. Which of the one following is not a state function ?

A. Internal energy

B. Work

C. Entropy

D. Free energy

Answer: B

Watch Video Solution

3. The temperature of K at which ΔG =0 for a given reaction with ΔH= -20.5 kJ mol^{-1} and ΔS =- 50.0 $JK^{-1}mol^{-1}$

A. -410

B. 410

C. 2.44

D. -2.44

Answer: B

Watch Video Solution

4. For which one of the following reactions , the entropy changes is positive ?

A. $H_2(g) + \frac{1}{2}O_2(g) \rightarrow H_2O(l)$

B. $Na^+(g) + CI^-(g) \rightarrow NaCI(s)$

C. $NaCI(l) \rightarrow NaCI(s)$

D. $H_2O(l) \rightarrow H_2O_g$

Answer: D

Watch Video Solution

5. Molar heat capacity (C_p) of water of constant pressure is $75JK^{-1}mol^{-4}$. The increase in temperature (in K) of 100g of water when I kJ of heat is supplied to it is

A. 2.4

B. 0.24

C. 1.3

D. 0.13

Answer: A

Watch Video Solution

6. Which of the following is true for an exothermic reaction A $\Leftrightarrow$ B if E, and $E_b$are the activation enegries of formard and backward reactions respectively?

A. $E_f > E-(b)$

B. $E_f = E_b$

C. $E_f = -E_b$

D. $E_f < E_b$

Answer: D

Watch Video Solution

7. What is the entrophy change in JK^{-1} during the melting og 27.3 g ice at $0^{\circ}C$?(Latent heat of fusion of ice $= 330Jg^{-1}$

A. 330

B. 12.1

C. 3.3

D. 33

Answer: D

Watch Video Solution

8. A system is provided with 50 J of heat and the work done on the system is 10J .What is the change in internal energy of the system in joules ?

A. 60

B. 40

C. 50

D. 10

Answer: D

Watch Video Solution

9. Calculate H° for the reaction ,

$Na_2O(s) + SO_3(g) \rightarrow Na(2)SO_4(g)$

(A)$Na(s) + H_2O(l) \rightarrow NaOh(s) + \frac{1}{2}H_2(g)$

$\Delta H^\circ) = -146kJ$

(B) $Na_2SO_4(s) + (H)_2O(l) \rightarrow 2Na(s) + SO_3(g)$

$\Delta H^\circ = +418kJ$

(C) $2Na_2O(s) + 2H_2(g)) \rightarrow 4Na(s) + 2H_2O(l)$

$\Delta H^\circ = +259kJ$

A. $+832kJ$

B. $-581kJ$

C. $-431kJ$

D. $+531kJ$

Answer: B

Watch Video Solution

10. Calcutate ΔH in kJ for the following reaction

$C(g) + O_2(g)$

Given that ,

$H_2O(g) + C_g \rightarrow CO(g) + H_2(g), \Delta H = +131kJ$

$CO(g) + \frac{1}{2}O_2(g) \rightarrow CO_2(g)' \Delta H = -282kJ$

$H_2(g) + \frac{1}{2}O_2(g) \rightarrow H_2O(g) \Delta H = -242kJ$

A. -393

B. $+393$

C. $+655$

D. -655

Answer: A

Watch Video Solution

Watch Video Solution

11. Calcutate enthalpy for formation of ethylene form the following data

(I)$C_{(\,graphtie\,)} + O_2(g) \rightarrow CO_2(g), \Delta = -393.5kJ$

(II)$H_2(g) + \frac{1}{2}O_2(g) \rightarrow H_2O(l), \Delta H = -286.2kJ$(III)

$C_2H_4(g) + 3O_2(g) \rightarrow 2CO_2(g) + 2H_2O(l)\Delta H = -1410.8kJ$

A. 54.1kJ

B. 44.8kJ

C. 51.4kL

D. 48.4kJ

Answer: C

Watch Video Solution

12. Identify the reaction for which DeltaH ne DeltaE.

A. $S(rhombic) + O_2(g) \rightarrow SO_2(g)$

B. $N_2(g) \rightarrow 2NO(g)$

C. $H_2(g) + CI_2(g) \rightarrow 2HC1(g)$

D. $CO(g) + \frac{1}{2}O_2(g) \rightarrow CO_2(g)$

Answer: D

Watch Video Solution

13. Which of the following is not true is not correct?

A. Dissolution of NH_4CI in excess of water is an endothermic process

B. Neturalisation process is always exothermic

C. The absoltute value of enthaloy (H) can be detemine experimentally

D. The heat of reaction at constant volume is denote by ΔE.

Answer: C

Watch Video Solution

14. Average C-H bond enery is$416kJmol_{-1}$ Which of the following is correct?

A. $CH_4(g) + 416kJ \rightarrow C(g) + 4H(g)$

B. $CH_4(g) \rightarrow C(g) + 4H(g) + 416kJ$

C. $CH_4(g) + 166kJ \rightarrow C(g) + 4H(g)$

D. $CH_4(g) \rightarrow C(g) + 4H(g) + 16164kJ$

Answer: C

Watch Video Solution

15. Which of the following is an endothemic reaction?

A. $N_2(g) + 3H_2(g) - 92kJ \rightarrow 2NH_3(g)$

B. $N_2(g) + O_2(g) + 180.8kJ \rightarrow 2NO$

C. $H_2(g) + CI_2(g) \rightarrow 2HCl(g) + 184.6kJ$

D. $C_{\text{graphite}} + 2H_2(g) \rightarrow CH_2(g) + 74.8kJ$

Answer: B

Watch Video Solution

16. When 10g of methane is completely burnt in oxygen the heat evolved is 560kJ. What is the heat of combustion (in kJ mol^{-1} of methane ?

A. -1120

B. -968

C. -896

D. -560

Answer: C

Watch Video Solution

17. Calculate the heat of combustion (in kJ) of the methane from the following data.(I)

$C_{graphite} + 2H_2(g) \rightarrow CH_4(g), \qquad \Delta H = -74.8kJ$

II $C_{graphite} + O_2(g) \rightarrow CO_2(g), \qquad \Delta H = -3935kJ$

III $H_2(g) + \frac{1}{2}O_2(l) \qquad \Delta = -286.2kJ$

A. -891.1

B. 816.3

C. -965.9

D. -1040.7

Answer: A

Watch Video Solution

18. Calculate the heat of formation (ΔH) of CO from the following data.

(I) $C_{graphite} + 2H_2(g) \rightarrow CH_4(g), \quad \Delta H = -94kcal$ (II)

$CO(g) + \frac{1}{2}O_2 \rightarrow CO_2(g), \quad \Delta H = -68kcal$

A. -1.3

B. -26

C. -162

D. -82

Answer: B

Watch Video Solution

19. In which of the following reactions heat liberated is known as standard heat of formation of CO_2?

A. $2CO(g) + O_2(g) \rightarrow 2CO_2(g) + 135.5kcal$

B. $C_{\diamond} + O_2(g) \rightarrow 2CO_2(g) + 94.5kcal$

C. $C_{graphite} + O_2(g) \rightarrow CO_2(g) + 94.05kcal$

D. $CH_4(g) + 2O_2(g) \rightarrow CO_2 + 2H_O(l) + 212.8kcal$

Answer: C

Watch Video Solution

20. The heat of combustion of CH_4,C(graphite) and $H_2(g)$ are respectively 20 kcal and -40 kcal , -10 kcal. The heat of formation of CH_4 is

A. 40kcal

B. $+kcal$

C. 80 kcal

D. $-70kcal$

Answer: D

Watch Video Solution

21. In the complete combustion of butanol $C_4H_9OH(l)$ if DeltaH is enthalpy of combustion at constant pressure and DetlaE is the heat of combustion at constant volume ,then

A. $\Delta H > \Delta E$

B. $\Delta H = \Delta E$

C. $\Delta H < \Delta E$

D. ΔH, ΔE relation cannot be predicted

Answer: A

Watch Video Solution

22. Consider the followig reactions:

$C + O_2 \rightarrow CO_2, \Delta = -400 kJ mol^{-1}$

$2H_2 + O_2 \rightarrow 2H_2O, \Delta H = -570 kJ mol^{-1}$

$CO_2 + H_2O \rightarrow CH_4 + 20_2\Delta = 890 kJ mol^{-1}$

The heat of formation of methane is

A. $-180 kJ mol^{-1}$

B. $-1060 kJ mol^{-1}$

C. $-720kJmol^{-1}$

D. $-80kJmol^{-1}$

Answer: D

Watch Video Solution

23. Given that ,

(i)

$$CH_3CHO + \frac{5}{2}O_2 \rightarrow 2CO_2 + 2H_2O, \Delta H = -1168kJmol^{-1}$$

(ii)

$$CH_3COOH + 2O_2 \rightarrow 2CO_2 + 2H_2O, \Delta H = -876kJmol^{-1}$$

ΔH for the reaction ,

$$CH_2CHO + \frac{1}{2}O_2 \rightarrow CH_3COOH$$,is

A. 29^2kJmol^{-1}

B. $378kJmol^{-1}$

C. $195kJmol^{-1}$

D. $2044kJmol^{-1}$

Answer: A

Watch Video Solution

24. The reaction which proceeds with evolution of heat is called

A. Endothermic reaction

B. Exothermic reaction

C. Spontaneous reaction

D. Non -spontaneous reaction

Answer: B

Watch Video Solution

25. Given that bond energies of N=N,H-H and N-H bonds as 945, 436 and 391 kJ/ mol respectively ,the enthalpy of the reaction $N_2(g) + 3H_2(g) + \rightarrow 2NH_3(g)$, is

A. $-93kJ$

B. 102kJ

C. 90kJ

D. 105kJ

Answer: A

Watch Video Solution

26. For an ideal gas ,the relation between the enthaply change and internal energy change at constant temperature is given by

A. H=E+PV

B. ΔH=E+Δ nRT

C. $\Delta H = \Delta E + P\Delta V$

D. $\Delta H = \Delta G + T\Delta S$

Answer: C

Watch Video Solution

27. At constant temperature and pressure if `DeltaGLt0, the process is called

A. Isothermal

B. Non spontaneous

C. Spontaneous

D. Isobaric

Answer: C

Watch Video Solution

28. In which one of the following reactions does the heat change represent the heat of formation of water?

A. $2H_2 + O_2 \rightarrow 2H_2O, \Delta H = -116kcal$

B. $H_2 + \frac{1}{2}O_2 \rightarrow H_2O, \Delta H = -58kcal$

C. $H^+ + OH^- \rightarrow H_2O(l), \Delta H = -13.7kcal$

D. $C_2H_2 + 2\frac{1}{2}O_2 \rightarrow 2CO_2 + H_2O, \Delta H \pm 30kcal$

Answer: B

Watch Video Solution