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**Max Time : 1 hr** **Class = 11th Chemistry Test Max Marks : 25**

**THERMODYNAMICS**

1. Answer the following questions : [ 1 x 6 = 6 ]
2. Force is ……….. property whereas pressure is ………….. property in thermodynamics.
3. During isothermal expansion of ideal gas the change in internal energy is ……………… .
4. For the isothermal reversible expansion of an ideal gas from volume V1 to volume V2 , the work done is given by wrev = ……………….. Whereas for irreversible expansion, it is given by wirrev = ……………….. .
5. For a triatomic gas like CO2 , the ratio of CP/CV is equal to ………………………
6. For exothermic reactions, the enthalpy of products is ……………………. Than enthalpy of reactants.
7. U0 of combustion of methane is – 50 KJ mol – 1 . The value of H0 is

|  |  |  |  |
| --- | --- | --- | --- |
| a) = 50 | b) > 50 | c) < 50 | d) = 50 |

1. To what type of system the following belong ? [ 2 ]

|  |  |  |  |
| --- | --- | --- | --- |
| a) Tree | b) Pond | c) Animals | d) Tea placed in a kettle |
| e) Tea placed in thermos flask | | f) Tea placed in a cup | |

1. Separate out the following into extensive and intensive property : [ 2 ]

Volume , Temperature , Pressure , Boiling point , Free energy

1. Calculate the number of KJ of heat necessary to rise the temperature of 54 g of aluminium from 35˚C to 50˚C. Molar heat capacity of Al is 24 J mol K – 1. [ 2 ]
2. Enthalpies of formation of CO (g) , CO2 (g) , N2O (g) and N2O4 (g) are – 110 , - 393 , 81 and 9.7 KJ mol – 1 respectively. Find the value of H for the reaction : [ 2 ]

N2O4 (g) + 3 CO (g) → N2O (g) + 3 CO2 (g)

1. The equilibrium constant for a reaction is 5. What will be the value of 0 ? [ 2 ]

(R = 8.314 J mol – 1 K – 1 , T = 127˚C).

1. 0.16 g of methane was subjected to combustion at 27˚C in a bomb calorimeter system. The temperature of the calorimeter system (including water) was found to rise by 0.5˚C. Calculate the heat of combustion of methane at (i) constant volume, (ii) constant pressure. The thermal capacity of the calorimeter system is 17.7 KJ/K . (R = 8.314 KJ mol – 1 K – 1 ) [ 2 ]
2. The enthalpy change (H) for the reaction : N2 (g) + 3 H2 (g) → 2 NH3 (g) is – 96 KJ at 298 K. What is U at 350 K. [ 2 ]
3. The internal energy change (U) for the reaction : CH4 (g) + 2 O2 (g) → CO2 (g) + 2 H2O (l) is - 885 KJ mol – 1 at 298 K. What is H at 298 K. [ 2 ]
4. An athlete is given 100 g of glucose (C6H12O6) of energy equivalent to 1560 KJ. He utilize 50 % of this gained energy in the event. In order to avoid storage of energy in the body. Calculate weight of water he would need to perspire. The enthalpy of evaporation of water is 44 KJ/mol. [ 3 ]