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

**THERMODYNAMICS**

1. During isothermal expansion of ideal gas the change in internal energy is ……………… . [ 1 ]
2. For a triatomic gas like CO2 , the ratio of CP/CV is equal to ……………………… [ 1 ]
3. Define Closed system and isolated system. [ 2 ]
4. Define Heat capacity and specific heat capacity. [ 2 ]
5. 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. 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 ]
3. 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 ]
4. 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 ]
5. Calculate Q , W , U and H for the isothermal reversible expansion of one mole of an ideal gas from an initial pressure of 1 bar to a final pressure of a 0.1 bar at a constant temperature of 273 K. [ 2 ]
6. The heat of combustion of benzene in a bomb calorimeter (i.e. constant volume) was found to be 3263.9 kJ/mol at 25˚C. Calculate the heat of combustion of benzene at constant pressure. [ 2 ]
7. Two litres of an ideal gas at a pressure of 10 atm expands isothermally into vacuum until its total volume is 10 litres. How much heat is absorbed and how much work is done in this expansion? What would be the heat absorbed and work done. [ 3 ]
8. If the same expansion takes place against a constant external pressure of 1 atm?
9. If the same expansion takes place to a final volume of 10 litres conducted reversibly.