

ISSUES OF PHYSICAL CHEMISTRY

2018-2019

LESSON 1

1. Classify each magnitude as extensive or intensive:
 - a) Temperature
 - b) Mass
 - c) Refractive index
 - d) Molar volume
2. Justify whether the following statements are true or false:
 - a) ΔH is a state function.
 - b) C_V of an ideal gas is independent of temperature.
 - c) $Q = 0$ in a cyclic process.
 - d) In a closed system with only PV work, a process at constant pressure with $q > 0$ must imply $\Delta T > 0$.
3. Justify, using the appropriate equations, whether the following statements are true or false:
 - a) The magnitudes H, U, PV, Q, W, ΔH and $P\Delta V$ have all the same dimensions.
 - b) ΔH is only defined for a process at constant pressure.
 - c) In a process at constant volume for a closed system: $\Delta H = \Delta U$.
 - d) Heat of an irreversible change from state 1 to state 2 may be different from heat of the same state change performed reversibly.
4. Determine if the following quantities: q, w, V, ΔH , ΔU , ΔS , are higher, lower or equal to zero for the following processes:

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5. Justify, using the appropriate equations, whether the following statements are true or false:

a) Work can always be calculated through the following expression:

$$W = -nRT \log \frac{V_2}{V_1}$$

b) The following equation enables the calculation of the variation of the system internal energy in any process:

$$dU = C_v dT$$

c) When an ideal gas undergoes a transformation in which the thermodynamic variables: pressure, volume and temperature are not constant, the variation of enthalpy of the process must be calculated through the following expression:

$$\Delta H = R \Delta T$$

d) The following equation can be applied in any system and for any process:

$$\Delta S = \frac{\Delta H}{T}$$

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