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| **School of Pedagogical Sciences (SPS)**  **M.G University Kottayam as a part of Ph. D Programme**  Research Scholar  **: Shanavas K.E**  Supervising Teacher **: Dr Sajna Jaleel Professor SPS** | | | |
| **Action Script : E Content Lesson based on CDM T 7**  Name of Teacher**:** Shanavas K.E Standard: XI Science  Subject: Chemistry Strength: 59  Topic: Enthalpy H. Relation between ∆H and ∆U Time: 6 minutes Chapter: Thermodynamics | | | |
| Audio | Video | Tg-lg activities | Phases of CDM |
| Hello Plus One Students,  Welcome to the world of plus one chemistry. chapter 6 T.D. This is E content Lesson -7 Today I focus up on second Thermodynamic function – Enthalpy H, Enthalpy change ∆H and Relation between ∆H and ∆U  Can you give the name of First  Thermodynamic function.  Internal energy  intrinsic energy  Which letter is represented by internal energy? U  It is the latest notation as per IUPAC. ’E’ replaced by ‘U’.    Define U and ∆U?  Internal energy U is the total energy contained in a system.  The change in internal energy ∆U represent the heat evolved or absorbed at constant volume.  When the reaction is carried out at constant pressure, what are the two possibilities of volume change is  Increase in volume result in the expansion of gas at constant P. The heat evolved will be less than at constant V because the part of the energy has to be utilized for expansion of gas.  Decrease in volume result in the contraction of gas at constant pressure. The work done of gas on the system and heat evolved will be greater than at constant V  Energy changes occurring at constant P not simply due to  Internal energy alone but also  include expansion or contraction or P-V work.  Can you give Mathematical representation of Enthalpy H  H = U + PV  Can you give relation between ∆H and ∆U?  Give equations of Enthalpy change, ∆H  ∆H = ∆U + P∆V 🡪 1  Is solid and liquid, ∆H and ∆U is same or different. How? Same.  For solid and liquid, there is no change in volume at constant p.    ∆V = 0 So that P∆V=0 Hence ∆H = ∆U  Is volume change become significant in the reaction of gas?  Yes  Using ideal gas equation  PV = nRT  PV = nRT1 🡪 2  PV = nRT2 🡪 3  Equation 3 - 2  P (V2 – V1) = (n2-n1) RT  P∆V = ∆n RT  Substitute in equation 1  ∆H = ∆U + ∆n RT  What is ∆U?  ∆U = qv  Heat evolved or absorbed at constant volume.  What is ∆H?  ∆H=qp  Heat evolved or absorbed at constant pressure  Can you relation between qp and qv ?  qp = qv + ∆n RT  **Time gap online Assignment**  Problem  The enthalpy changes for a reaction.    N2(g) + 3H2 (g) 🡪 2NH3 (g)  is -93.0 KJmol-1 at 300K. Calculate the value of ∆U.  Given R = 8.314 JK-1 mol-1    Solution:    N2(g) + 3H2 (g) 🡪 2NH3 (g)  ∆H = -93.0 KJmol-1  ∆n = 2 – 4 = -2 mol  ∆H = ∆U + ∆n RT  -93.0 – (-2) 8.314 x 10 - 3 x300  ∆H = 88.014 KJmol-1 | Teacher presents  Slide 1  Thermodynamic Function Internal energy U  Slide  Change in internal energy  Slide  Definition of Internal energy U.  Slide  Definition of Internal energy U.  Slide  Expansion of gas  Slide  Contraction of gas  Slide  Enthalpy  H=U+PV  Slide  ∆H = ∆U + P∆V  Slide  Equation of enthalpy change.  Slide  For solid and liquid  ∆H = ∆U  Slide  Derrivation of enthalpy change from ideal gas equation.  Slide  ∆H = ∆U + ∆n RT  Slide  Relation between qp and qv.  Slide  qp = qv + ∆n RT  Slide  Problem  Slide  ∆H = ∆U + ∆nRT  = -93.0 - (2) x8.314 x10-3 x 300 = -88.014 KJmol-1  Thank you.  Revise E content Lesson.  Enjoy chemistry. Learn Well. | Gaining the Attention to the objectives  Presentation of Slides  Audio video input giving symbols and equations.  Develop the content  Asking questions.  Audio-video input giving more applications.  Audio-video input giving equations and explanations.  Audio-video input giving relationship between  ∆H, ∆U and ∆n  Audio-video input giving more applications and problems.  Evaluate and assess the content.  Assigning problems to students. | **Phase 1**  Establishes report with the students.  Confrontation with stage relevant task  Elicit student’s responses.  **Phase 2**  Inquiry  Probes reasoning.  Insisting to think.  Seeks justification.  Offer counter suggestion  Seeks reasoning  Giving perceptual cues or hints.  Seek  Justification results in Assimilation.  Giving perpetual  Cues or hints  Probes reasoning.  Accommodation  of new learning experience leading to ability to apply in different learning situations. |