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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 4**  Name of Teacher**:** Shanavas K.E Standard: XI Science  Subject: Chemistry Strength: 59  Topic: Sign conventions of heat and work. First law of T.D. Thermodynamic function. Time : 6 minutes Chapter: Thermodynamics. | | | |
| Audio | video | Tg-lg activities | Phases of CDM |
| Hello plus one students,  Welcome to world of plus one Chemistry: Chapter 6 T.D. This is the E Content Lesson based on CDM 4  Today we shall study about sign conventions of heat, q and work, w and first law of T.D. and Thermodynamic function.  Let us see the diagram of system and surroundings.  What is the sign conventions of  heat, q and work, w ?  Heat added to the system q = +ve  Heat given out from system q = -ve  Work done on the system w = +ve  Work done by the system w = -ve  Can you predict sign conventions of  heat, q and work, w from following statement?  Work done by the surroundings w = +ve  Work done on the surroundings w = -ve  Heat absorbed on the system  q = +ve  Heat absorbed by the surroundings q = +ve  Let us take a balloon and is fitted on the mouth of a bottle. It is then placed in a hot water contained steel vessel.  What happened to the balloon?  Balloon expands.  What happened to the system?  Heat q supplied to the system, the balloon expands, work done by a system.  Can you write the equation of this experiment?  ∆U = q – w  Where ∆U represent change in internal energy, heat added to the system +q and work done by the system -w.  This equation is known as First law of Thermodynamics.  Can you define internal or intrinsic energy?  The total energy contained in a system is called its internal energy. The latest notation of internal energy is U.  What is change in internal energy ∆U ?  It is the difference between the internal energies of the products ∑UP and ∑UR  ∆U = ∑UP  **-**∑UR  Can you predict the value of ∆U in the following  For processes involving evolution of energy UP < UR  Thus, ∆U < 0 ∆U = -ve  For processes involving  absorption of energy UP > UR  Thus, ∆U > 0 ∆U = +ve  For an isothermal process involving ideal gas, temperature is constant.  Hence ∆U = 0  ∆U = 0 means?  There is no increase in internal energy of the system.  The work done by the system is equal to heat absorbed by the system.  q = -w (From 1st law of T.D. ∆U = q + w since ∆ U = 0)  **Time gap online Assignment**  Give the equation for First law of T.D ?  ∆U = q + w  Can you define First law of T.D ?  The first law of T.D states that energy can neither be created nor destroyed. It can be transformed from one form to another. The total energy of the universe (system and surroundings) remains constant.  Give limitation of First law of T.D ?  It does not tell us anything about the extent and direction of convertibility of one form of energy into another.  It does not provide any information about spontaneity or feasibility of reaction. | Teacher presents  Slide    Slide  Sign conventions of heat and work  Slide  Question and statement.  Video based on  First law of Thermodynamics.  The experimental demonstration of 1st law of T.D.  Slide  Question  Slide  Equation of 1st law of T.D.  Slide  definition of internal energy U.  Slide  Definition of change in internal energy ∆U.  Slide  Equation of change in internal energy ∆U.  Slide  UP < UR ∆U = -ve  Slide  UP > UR ∆U = +ve  Slide  Isothermal process  ∆U = 0  Slide  ∆U = 0  1st law of T.D  ∆U = q + w  0 = q + w  q = -w  Evaluate and assess the content  Slide  Questions  Slide  Definition of 1st law of T.D.  Slide  Limitation of 1st law of T.D.    Slide  Thank you  Learn well  Revise E content Lesson  Enjoy Chemistry in a simple way | Gaining the attention to objectives  Presentation of slides  Asking questions  Developing the content  Audio-Video input entering into the content  Audio-video input giving Experiments, applications and problems  Developing the content  Asking questions  Audio-Video input entering into the content  Presentation of slides.  Audio-video input giving more examples based on the content.  Asking questions.  Audio-video input giving definition of  First law of T.D.  Presentation of slide related to limitation of First law of T.D. | **Phase 1**  Establishes rapport with the students.  Presents a puzzling problem  **Phase1**  Confrontation with stage relevant task  Insisting to think  Elicits students’ responses  Seeks probing  Giving perceptual cues or hints.  **Phase 2**  Inquiry  Probe’s reasoning  Offer counter suggestion  Seeks justification results in assimilation  Seeks justification  Offer counter suggestion  Insisting to think  **Phase 3**  Transfer  Seeks reasoning  Elicit student’s responses.  Accommodation of new learning experience leading to ability to apply in different learning situations. |