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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 13**  Name of Teacher**:** Shanavas K.E Standard: XI Science  Subject: Chemistry Strength: 59  Topic: Condition for ∆G to be spontaneous and 3rd low of T.D 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 the E content Lesson based on CDM-13  Today focus upon the condition for Gibb’s free energy ∆G to be spontaneity and IIIrd law of T.D  Write Gibb’s Helmholtz equation?  Relation between ∆G, ∆H and ∆S?  ∆G = ∆H - T∆S  Can you give Energy or Enthalpy factor and Entropy factor in Gibbs Helmholtz equation?  ∆H is Enthalpy factor  T∆S is Entropy factor  How ∆G is spontaneous?  i)If both factors (enthalpy and entropy factor) favorable  That is, ∆H = -ve ∆S = -ve  Hence, ∆G is –ve. The process is Spontaneous at all temperatures  ii)If energy factor favors, entropy factor opposes. What will be the value of G? if ∆H >T∆S    ∆H is –ve ∆S is –ve  That is, ∆G is –ve ∆H >T∆S  The process is Spontaneous at low Temperature.  (iii) Energy factor opposes, Entropy factor favors. What will be the value of ∆G if T∆S >∆H ?  ∆H is +ve ∆S is +ve  That is, ∆G= -ve if T∆S > ∆H  Can you effect of temperature on spontaneity of process?  For exothermic reaction, ∆H is  always –ve. Spontaneous at low T. Using Gibb’s Helmholtz equation   |  | | --- | | ∆G = ∆H - T∆S |   If T∆S is +ve, then ∆G is – ve. Spontaneous. if T∆S is – ve, then ∆H is – ve only if ∆H >T∆S and occurs at low T.  What about endothermic reaction ?  ∆H is +ve Spontaneous at high T.  If T∆S is – ve, then ∆G is +ve Non spontaneous.  If T∆S is +ve than ∆G is –ve. Spontaneous only if T∆S >∆H and occurs at higher temperature.  Can you arrange the increasing order of entropy in the case of solid, liquid and gas ?  Solid < liquid < Gas  What about the entropy of solid ? very less  What about entropy of perfectly crystalline solid ?  Very minimum or taken as zero  See gas enclosed in a cylinder. What happen temperature decreases then up to zero Kelvin?  The energy of pure substance increases with decrease in temperature  Can you define IIIrd  law of T.D?  IIIrd law of T.D states that at absolute zero, the entropy of all perfectly crystalline solid may be taken as zero  How will you calculate the absolute entropy of pure substance at different temperature?  That is, Application of Third law of T.D  Calculation of absolute entropies of pure substance at different temperatures.  **Time gap online Assignment**  Define residual entropy | Teacher presents  Slide  Condition for ∆G to be spontaneous and 3rd law of T.D  Slide (question)  Gibb’s Helmholtz equation  Slide  Slide (question)  How ∆G is spontaneous  Slide  Effect of temperature on spontaneity of a process  Slide    Slide (Entropy Order)  Solid < liquid < Gas  Slide  Entropy of solid, liquid and Gas  Slide and video    Slide  Definition of IIIrd law of T.D  Slide  Application of IIIrd law of T.D  Slide  (Definition of residual entropy) There are certain substance which presses some entropy even at absolute zero is known as Residual Entropy  Slide  Revise E contest lesson. Designate a study area. Get organized. Reward yourself. Enjoy chemistry. Learn well. Thank you all. | Giving the attention to the objectives  Presentation of slides  Audio video input  Asking questions  Audio video input giving equation and  representation  Audio-video input  Audio-video input  Asking questions  Audio-video input giving examples.  Audio-video input giving more applications and problems        Evaluate and assess the content | **Phase 1**  Establishes report with the students.  **Confrontation with stage relevant task**  Present a puzzling problem  **Phase 2**  **Inquiry**  Probes reasoning  Insist to think  Elicits students’ responses  Offer counter suggestions  **Phase III**  **Transfer**  Seeks justification.  Insist to think  Seeks  Justification result in assimilation  Accommodation of new learning experience leading to ability to apply in different learning situations |