welcome back on this unit on thermodynamics
and in this sixth lecture of this unit and we have talked about ah you know introductory
basics introductions heat energy first law in last class last few classes enthalpy
and heat capacity as all was discussed in last class we talked about enthalpy of reaction
enthalpy of formation enthalpy of phase transition and we will continue um enthalpy of
different enthalpy of different processes and reaction just to recap what we studied about enthalpy of reaction this enthalpy of reaction at a particular
temperature t we write as a i h m minus b i h m a i n b i these are the stoichiometric
coefficients for products and reactants respectively and reaction enthalpy or enthalpy of
reaction standard enthalpy of reaction or standard heat of reactions are generally should be written
at a particular temperature but in case it is not written then we can assumed it to be 25 degree
centigrade which is a conventional temperature now you showed in the last class
that we can get the same information from the enthalpy of formations as well
so we can write a i for the products minus for the reaction that reactants at that particular temperature where del
h this term del f h naught is the enthalpy of formation for that particular species in this case reactants and products we also talked about ah standard
enthalpy of standard enthanp of formation in this case one mole of any substance
is formed from the reference states at that particular temperature and in standard state of one bar pressure now i mentioned this earlier also that this standard enthalpy of formation or standard heat of formation the enthalpy and heat for this
terminology is very often used ah interchangeably
so you can always tell standard heat
of reaction or enthalpy of reaction and for other processes and similarly for other process as well we also talked about standard ah enthalpy of phase change like ah phase transition like
fusion vaporization transition and sublimation we also talked about hess's law in last um lecture where basically we can take advantage that del h is a state
function which depends on initial and finance state which we can break down a reaction of a to b to as many numbers we want
so if this is del r h zero one this
is ten r h zero two and this is dinner h zero three then the standard
heat of reaction for the reaction can be written as the summation of the steps individual reaction we also talked about thermo chemical equation thermo
chemical equation which is a balanced reaction along with the value of standard reaction
enthalpy for that particular reaction and should be a particular temp particular
temperature in this case you also discuss ah three important things which should
be um remember that the stoichiometric coefficients ah represents number of

moles of reactants and products second that   this standard reaction gives free energy is an extensive quantity and for reverse reaction the value of standard reaction free energy reaction enthalpy

ah section enthalpy would be negative of the original reaction ok with same magnitude

 so these are the some of the things we

have discussed in last class and then we also solved two problems

 so in this lecture

we will continue what we left in last lecture what is that now we will

we talked about formation and formation as phase transitions now we will

talk about other process like combustion   and other things

 so first thing

we will talk about standard enthalpy of combustion the symbol is c h naught at particular

temperature you have to i need to   write the name of the

substance you are talking about

 so this basically the heat of reaction or standard

enthalpy of reaction for a combustion reaction   and

 so if i take a substance r one mole and react with oxygen and

produce carbon dioxide and water liquid and all of these in their

standard soil reactants and products are in their standard states at temperature

t then the reaction standard

enthalpy of reaction for this particular reaction   at temperature t is defined

as combustion standard enthalpy of combustion for that

particular substance dnr one example is ah glucose   combustion in what happens in body we take this

all the carbohydrates which we eat very frequently   it gets converted to

glucose and glucose on react

with oxygen do a perform a combustion reaction   inside body to produce lot of energy which is

utilized by us to do other work lot of work so   we can write in glucose

combustion reaction like this gas remember we are talking about one mole

we talked about one more in case of transition in case of

formation in case of combustion   except in case of reaction we always

talking about one mole

 so dentists   and these are all in their standard state

at particular temperature say in this case   your normal soil which means 25 degree

centigrade and

 so dental for glucose at 298 k is the standard enthalpy of

reaction for this particular reaction at 298k   which is two eight zero two kilojoule

 so this is the   amount of energy we obtained by burning

one mole of glucose at this temperature this is what are what is utilized   by us in doing lot of work we do we move to now

we will solve one problem and which is given here it says standard enthalpy of combustion of

benzene is given

 so c benzene is given c 6 h 6 is given as minus 3 2 6 7 kilos per mole and

standard enthalpy of formation is given for   carbon dioxide as 393 point the standard heater

formations they are tabulated

 so you can get   thermodynamic tables from which it is one of them

already

so given in your book
so you can get this   values for lot of substances this standard