

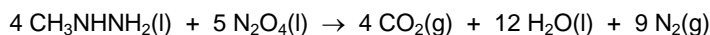
AS ENTHALPY CHANGES REVISION



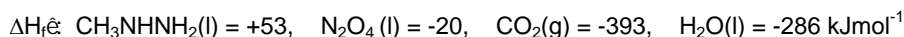
Name Form

- 1) a) Define standard enthalpy change of formation.
 b) Define standard enthalpy change of combustion.
 c) What are standard conditions?
 d) Write equations to represent the following enthalpy changes.
 - i) ΔH_f of ethanol
 - ii) ΔH_c of ethanol

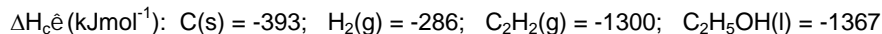
- 2) The engines of the lunar module of Apollo 11 used methylhydrazine (CH_3NHNH_2) and dinitrogen tetroxide. They react as follows:



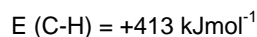
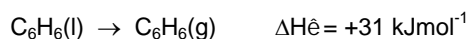
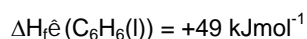
Calculate the enthalpy change for the reaction using the following data:



- 3) a) State Hess's law.
 b) Calculate ΔH_f^\ominus of the following using the ΔH_c^\ominus values provided.
 - i) ethyne ($\text{C}_2\text{H}_2(\text{g})$)
 - ii) ethanol ($\text{C}_2\text{H}_5\text{OH}(\text{l})$)



- 4) Calculate the average C-C bond enthalpy in benzene (C_6H_6) given the following data.



- 5) What is the sign of the following enthalpy changes (+ or -)?
 - a) combustion of magnesium
 - b) freezing water
 - c) melting ice

- 6) Calculate ΔH for the following reactions using the ΔH_c^\ominus 's below.

