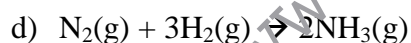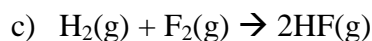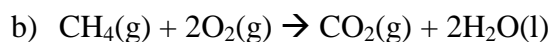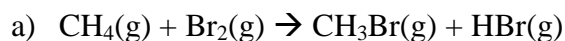**MEGA LECTURE**

Topic 4 Exercise 2 - bond dissociation energies

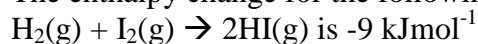1. Define the term 'bond dissociation energy'

bond	ΔH_b/kJmol^{-1}	bond	ΔH_b/kJmol^{-1}	bond	ΔH_b/kJmol^{-1}
C-H	+413	H-F	+565	C=C	+611
C-Br	+280	N N	+945	H-H	+435
H-Br	+366	F-F	+158	N-H	+391
Br-Br	+193	C=O	+805	O=O	+498
C-C	+347	O-H	+464	I-I	+151

2. Use the information in the table above to calculate approximate energy changes for the following reactions:

a) $CH_4(g) + Br_2(g) \rightarrow CH_3Br(g) + HBr(g)$

b) $CH_4(g) + 2O_2(g) \rightarrow CO_2(g) + 2H_2O(l)$

c) $H_2(g) + F_2(g) \rightarrow 2HF(g)$

d) $N_2(g) + 3H_2(g) \rightarrow 2NH_3(g)$

3. The enthalpy change for the following reaction:
$H_2(g) + I_2(g) \rightarrow 2HI(g)$ is -9 kJmol^{-1}
Use this information and the values in the above table to calculate the bond dissociation energy for the H-I bond

4. Explain why using bond dissociation energies only give you an approximate value for the overall energy change