

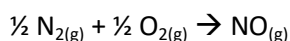
Bond Energy and the Types of Reactions

Homework – Student Edition

Use the bond enthalpies in the following table to answer the questions which follow:

H—H	436	N≡N	945	O=O	498	N—H	391
C—H	414	O—H	463	C=O	804	C—O	358
Cl—Cl	242	C—Cl	327	H—Cl	431		
F—F	159	H—F	567	C—F	489		
C—Br	285	H—Br	366	N=O	632		

1. Nitrogen oxide (NO), is formed during electrical storms, The equation for this reaction is:



Complete each of the tasks to calculate the bond enthalpy for the above reaction.

- a) Complete the table to show the energy absorbed by each of the bonds in reaction when they are broken

Reactant	Number of bonds	Enthalpy of bonds broken	Total enthalpy
N ₂			
O ₂			

- b) Calculate the total energy required

- c) Complete the table to show the energy released by each of the bonds in reaction when they are formed

Product	Number of bonds	Enthalpy of bonds formed	Total enthalpy
NO			

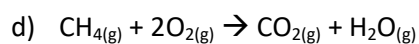
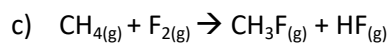
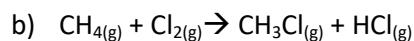
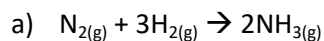
- d) How much energy is released?

- e) Calculate the enthalpy change in the reaction.

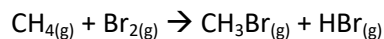
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2. Calculate the enthalpy change for each of the following reactions:



3. The reaction between bromine and methane is as follows:



If the enthalpy change for the reaction is -45 kJ mol^{-1} , calculate the bond energy for Br—Br.