I'm not a robot

Bond Lengths (r) and Hydrogen BondD(kJ/mol)r(pm) in Organic Chemistry ========== The bond lengths (r) and hydrogen bond dissociation energies (D, kJ/mol) are presented for various functional groups in organic chemistry. The data is sourced from Huheey, T.L. Cottrell, B. deB. Darwent, and S.W. Benson. Group 13: B-B 293, B-O 536, F-F 155 The bond dissociation energies for boron-containing functional groups are presented below: B-B 293, B-O 536 Group 14: C-C 346, C=C 602, C≡C 835 The bond dissociation energies for carbon-containing functional groups are listed below: C-C 346, C=C 602, C≡C 835 Group 15: N-N 167, N=N 418, N≡N 942 The bond dissociation energies for nitrogen-containing functional groups are presented as follows: N-N 167, N=N 418, N≡N 942 Group 16: O-O 142, O=O 494, S-S (S8) 226 The bond dissociation energies for oxygen- and sulfur-containing functional groups are listed below: O-O 142, O=O 494, S-S (S8) 226 Group 17: F-F 155, Cl-Cl 240 The bond dissociation energies for fluorine- and chlorine-containing functional groups are presented as follows: F-F 155, Cl-Cl 240The energy of chemical bonding is measured in various units, including kilojoules per mole (kJ/mol), and it's defined as the amount of work needed to break a bond between two atoms into infinity. ========== === The enthalpy of a chemical reaction can be estimated by summing up the energies of bonds present in products and subtracting the energies of bonds in substrates. This is represented by the equation: Δh = ∑nprod,iHprod,i - ∑nsubs,iHsubst,i, where Δh is the change in enthalpy, nprod,i is the number of moles of the i-th product, Hprod,i is the enthalpy of the i-th product, and similarly for substrates. ========== === A higher bond energy corresponds to a shorter bond length, but there's no straightforward way to convert bond length into energy or vice versa. The bond energy is a measure of its strength, with higher energies indicating greater work required to break the bond. Interestingly, the bond energy increases with multiplicity, such as in double bonds compared to single bonds. ========== ===