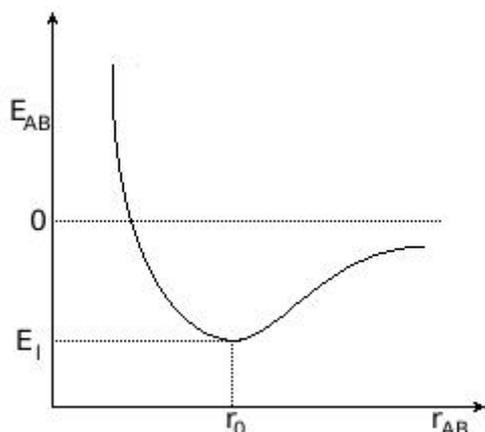


Answer on Question #49989, Chemistry, Physical Chemistry

Why does energy is released during the formation of chemical bond??

Solution:



Pic. 1. Dependence of the binding energy of the internuclear distance

Chemical bonding and the energy change occurring at the same time, can be described by the following model. Initially, the atoms are separated at a large distance and their interaction energy is close to zero. When atoms approach each other between them there is a weak interaction. When the internuclear distance becomes comparable to the radius of the electron shells of atoms between the atoms there are two competing processes. On the one hand there is a mutual attraction between the oppositely charged nuclei of atoms and electrons of another atom, on the other hand there is a mutual repulsion between like-charged nuclei and the electron shells of both atoms. At a certain distance r_0 forces repulsion and attraction between two atoms are aligned, there is a minimum of the potential energy of the system formed of two atoms E_1 and the formation of chemical bonds. Since E_1 is less than the total energy of the two isolated atoms, this process is accompanied by the release of energy.