

Question #49751, Chemistry, Physical Chemistry

why does unbonded atom has more energy than the bonded atom formed by chemical bond?how?

Answer:

Energy change during bond formation will consider using energy diagrams similar to those of atoms. Energy orbitals will celebrate the dash on the corresponding energy axis. When filling out the orbital electrons will follow the same three principles:

- 1) the lowest energy;
- 2) no more than two electrons to one MO;
- 3) the maximum number of MO filling if they have the same energy.

Let's start with the H₂ molecule. Fig. 1 shows its energy diagram.

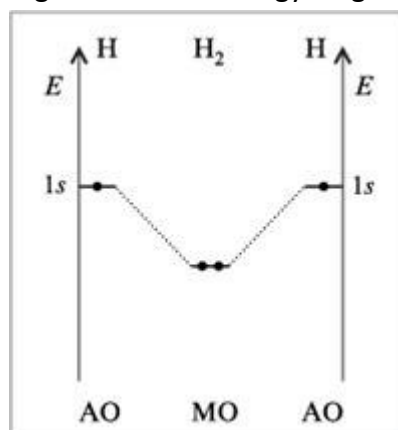


Figure 1

The left and right vertical axes energy marked overlapping energy 1s-AO two H atoms, and in the middle - the electrons in the energy levels of the molecule. MO energy is lower than the original AO.

The energy difference between the AO and MO, ie the energy released during the transition of electrons from the AO on the MO is the binding energy.

To break the bond, ie, the electrons return to their original hardware necessary to expend the same energy.

This rule holds because it is energetically favorable for the system.