

Electronic Structure Of Molecules At Surfaces

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During recent decades the field of molecular electronics has seen an increasing interest. Due to the wish to produce ever smaller devices up to the molecular scale the effort in nanoscience is unbowed. Molecules turned out to be either active or passive electronic components. To use single molecules one needs to understand especially the electronic properties of these molecules. There the molecular orbitals, in particular the HOMO (Highest Occupied Molecular Orbital) and LUMO (Lowest Unoccupied Molecular Orbital) come into play. An active area of research involves coupling a single molecule to a surface and eventually tailor new molecular electronic devices.

To understand the function and principles of molecules at surfaces one has to consider many questions like:

- How does a molecule bond to a surface?
- Does the structure of the molecule change when adsorbed on a surface?
- Is there any charge transfer between surface and molecule?

In my talk I will introduce this topic to you and we will try to find answers to such questions. I will cover the topics of adsorption as well as the modification of the electronic structure of the molecule when it is adsorbed on surface.

The measurement of the electronic structure is an important issue either. I will present a very famous method with which the electronic structure of molecules on surfaces can be observed.

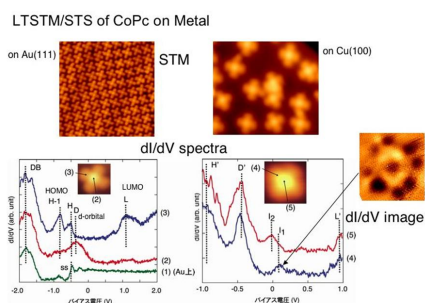


Figure 1: CoPc on metal surfaces and its electronic structure

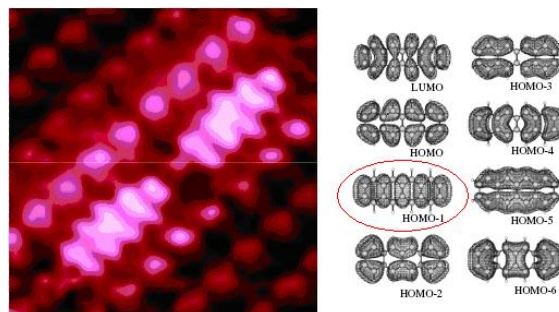


Figure 2: two tetracene molecules on an oxygen covered copper surface