

Thin-Film PV Technologies

Organic PV Technology

Week 5.5

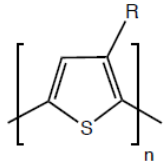
Arno Smets

Organic Solar Cells

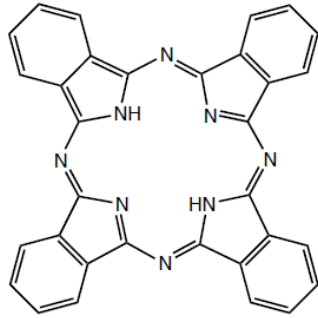


Source: Siemens

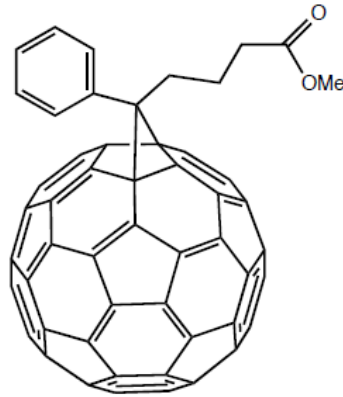
Organic Materials



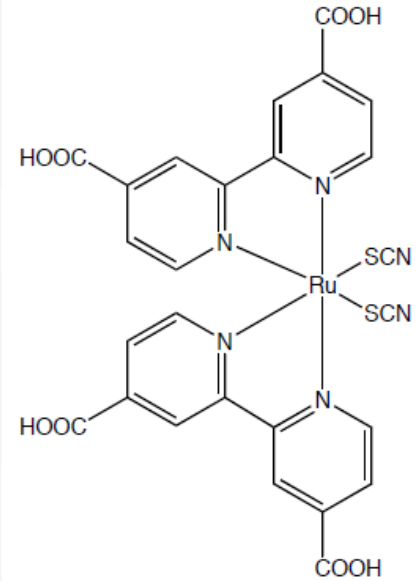
P3HT



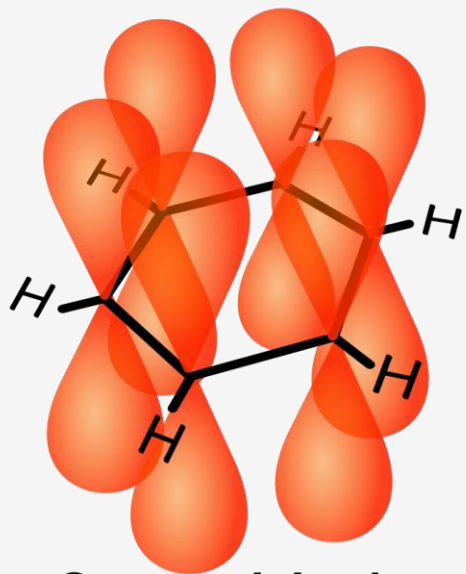
Phthalocyanine



PCBM

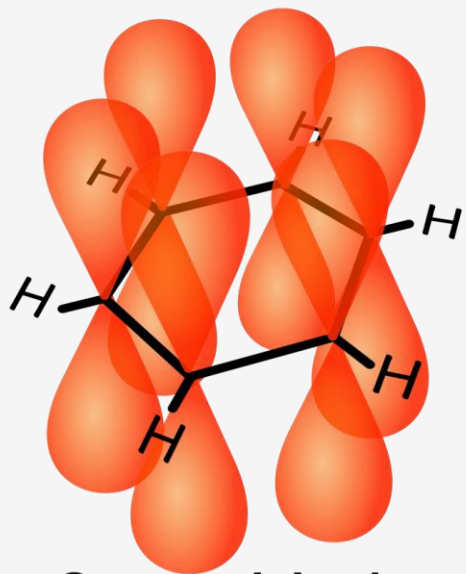


Conjugated systems: Benzene

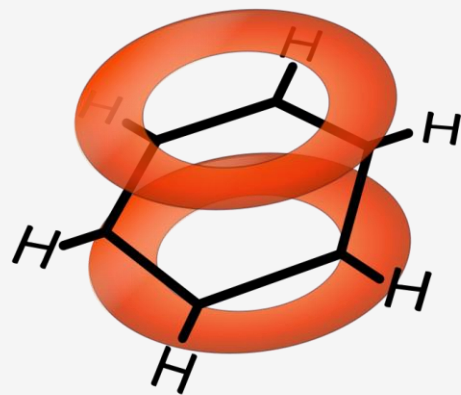


6 p-orbitals

Conjugated systems: Benzene

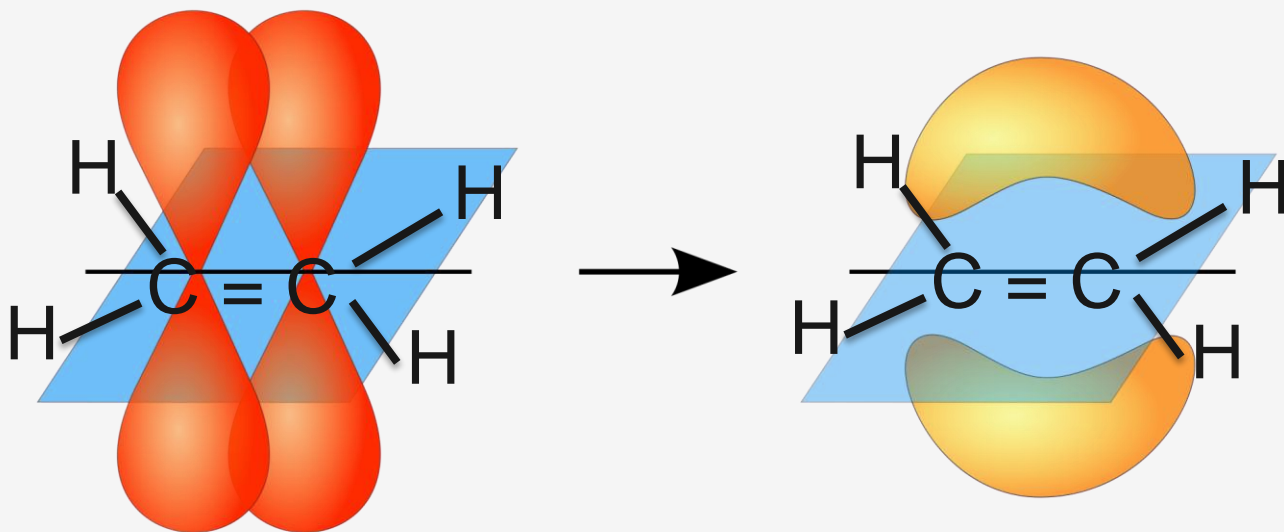


6 p-orbitals

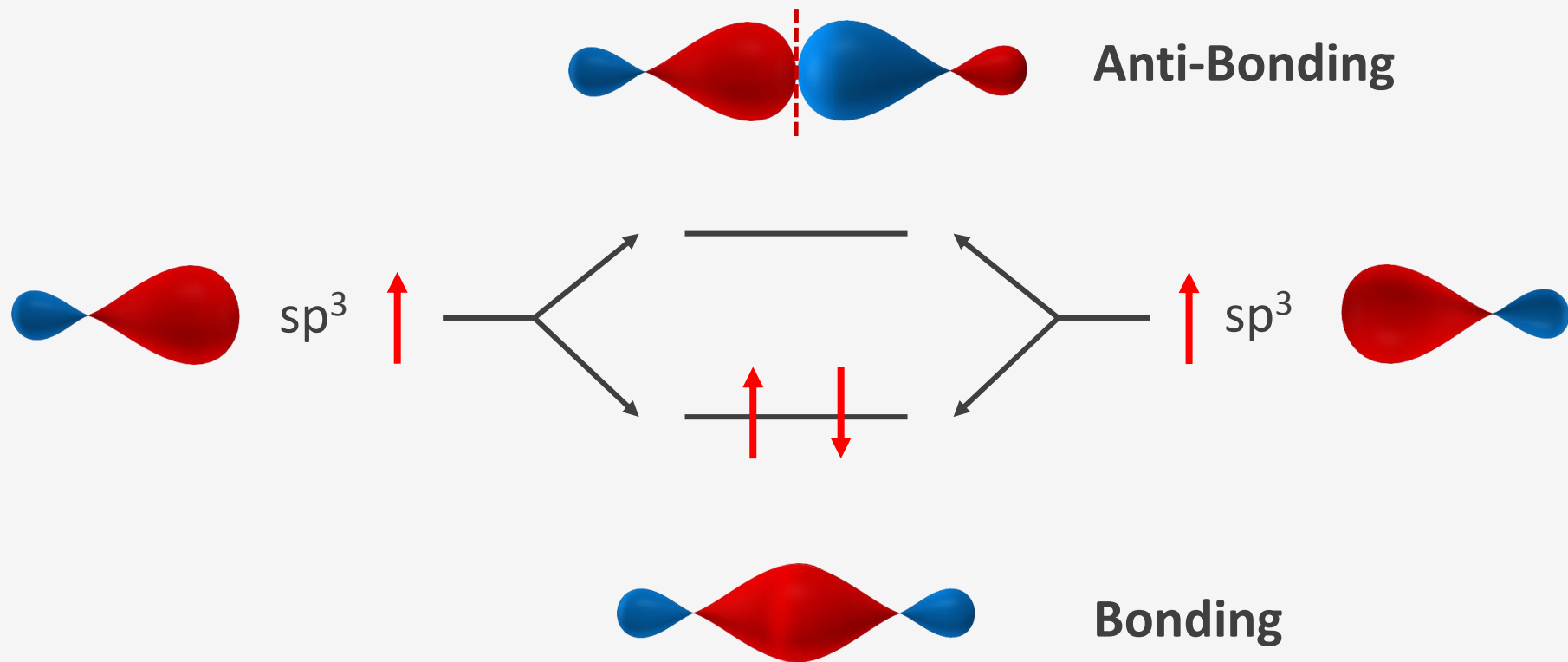


delocalized

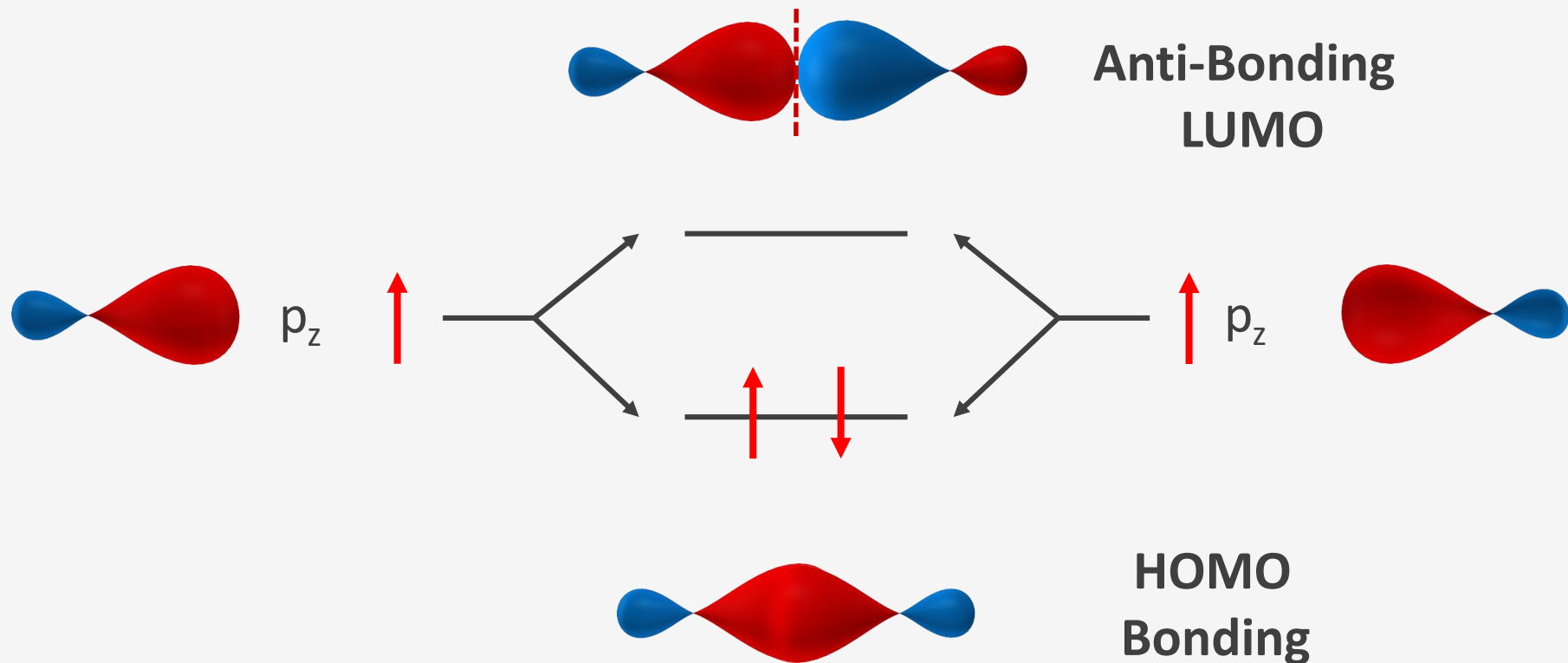
π -orbital



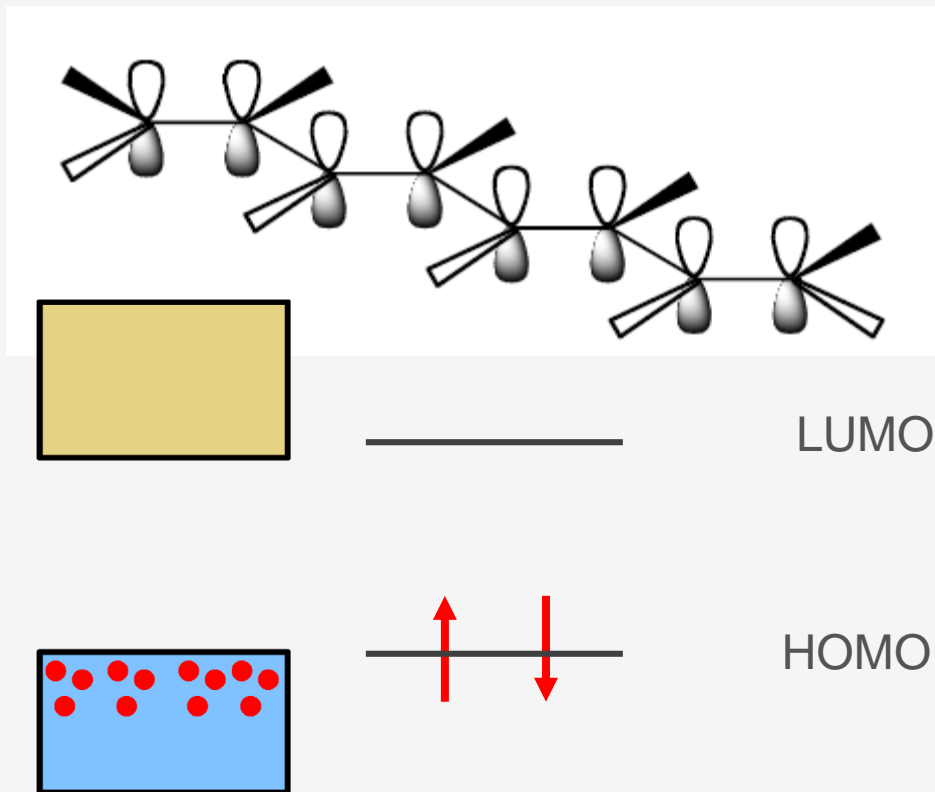
Molecular description of band gap



Molecular description of band gap



HOMO and LUMO



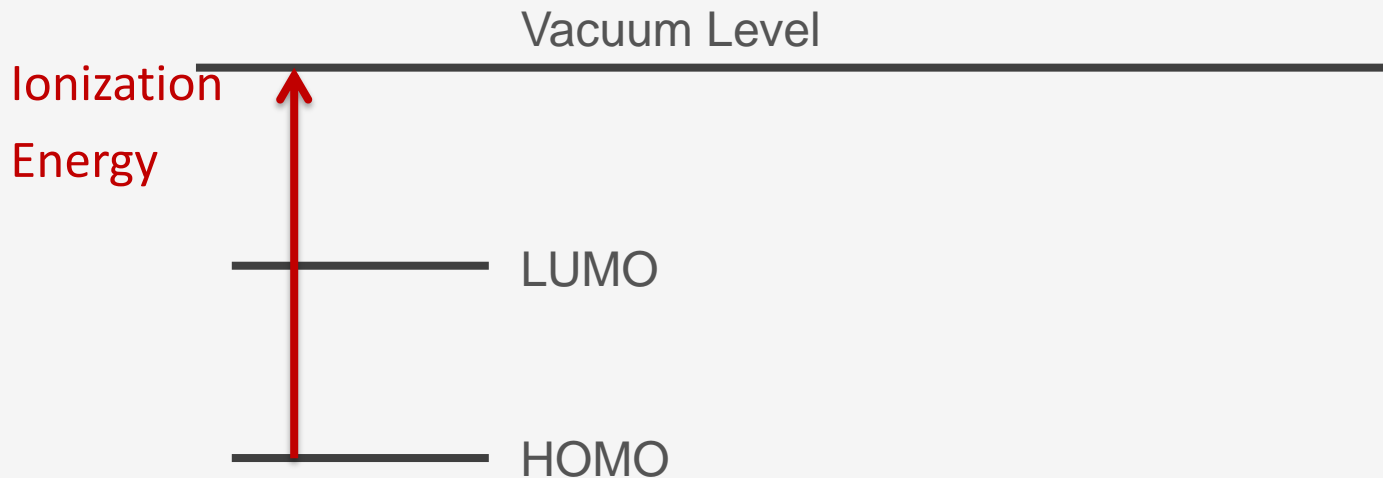
Electron donor and acceptor materials

Vacuum Level

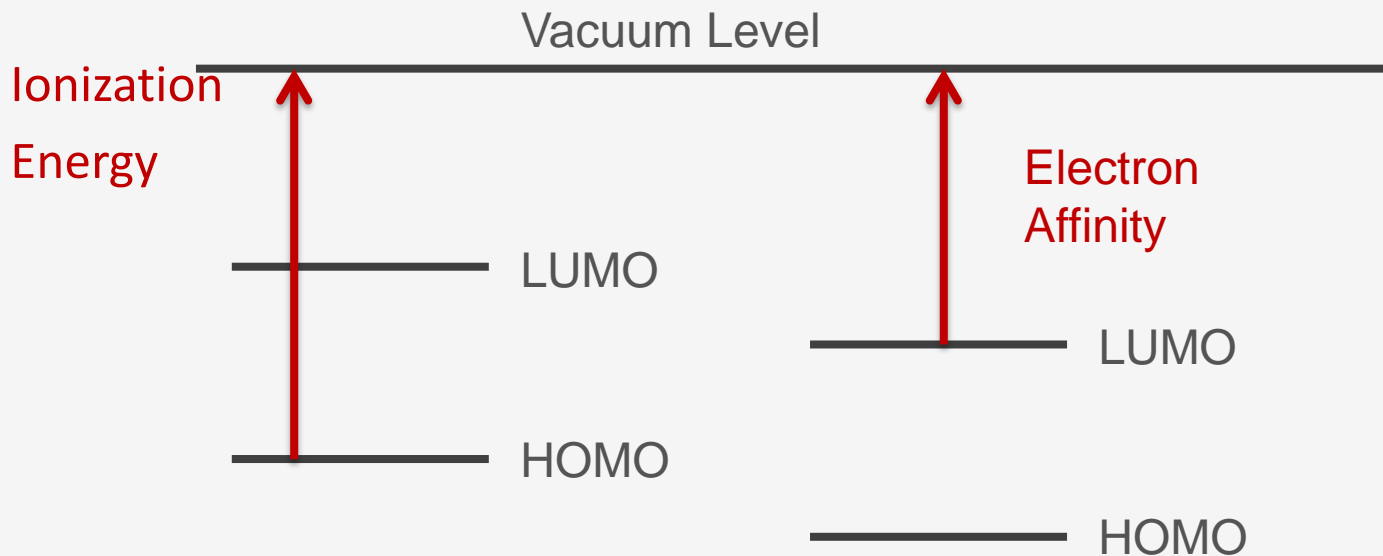
———— LUMO

———— HOMO

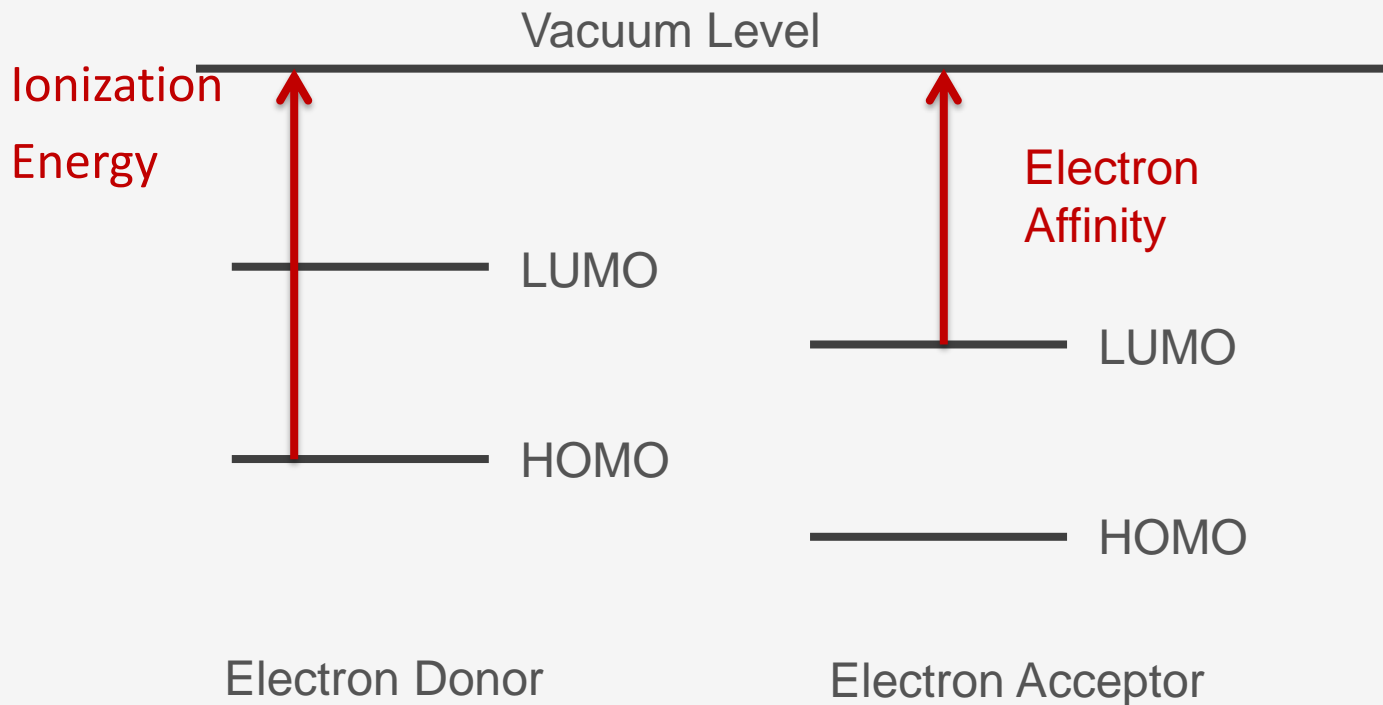
Electron donor and acceptor materials



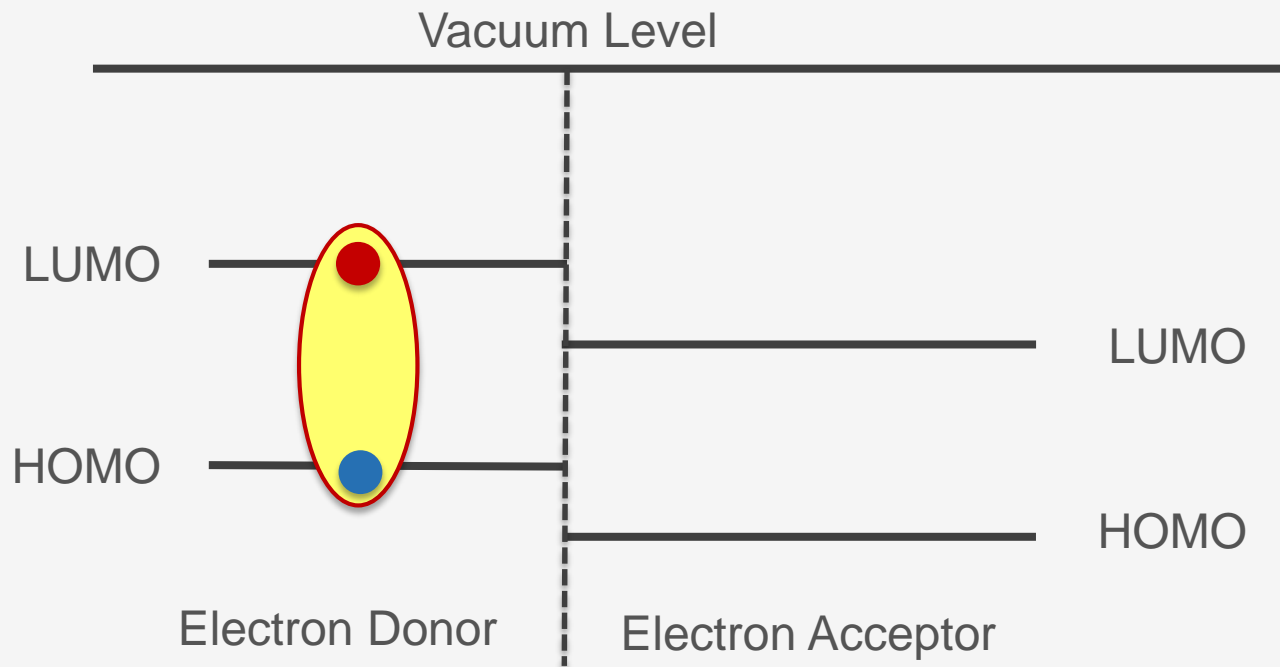
Electron donor and acceptor materials



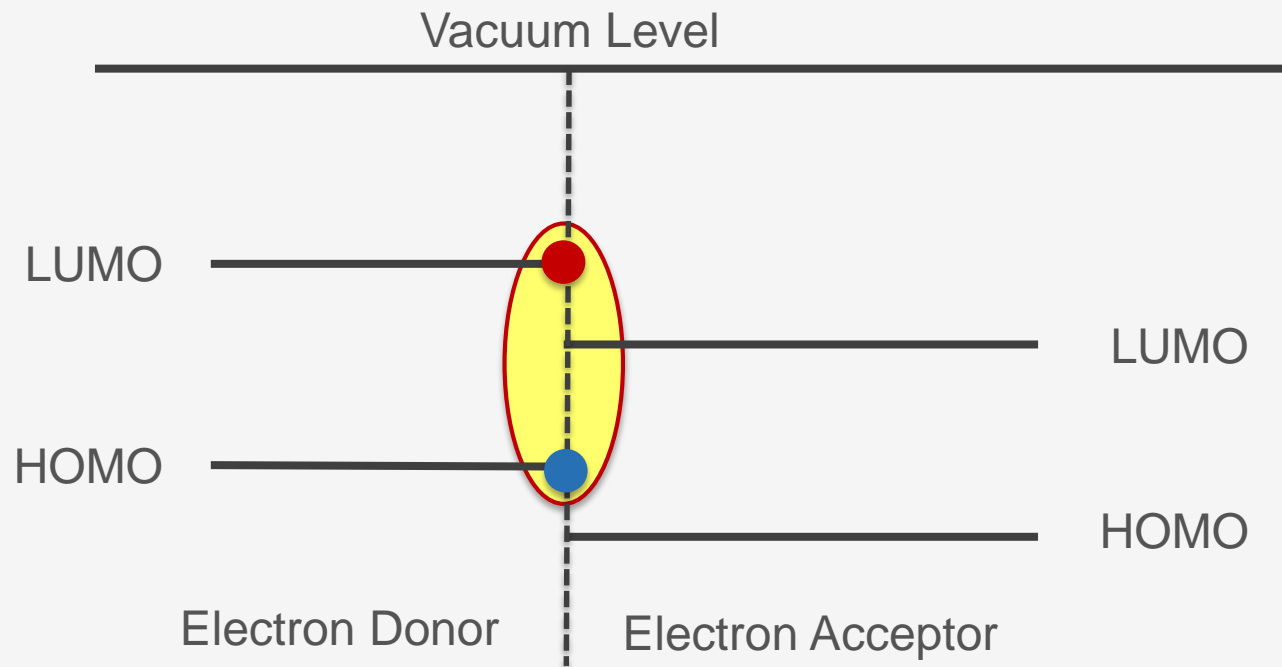
Electron donor and acceptor materials



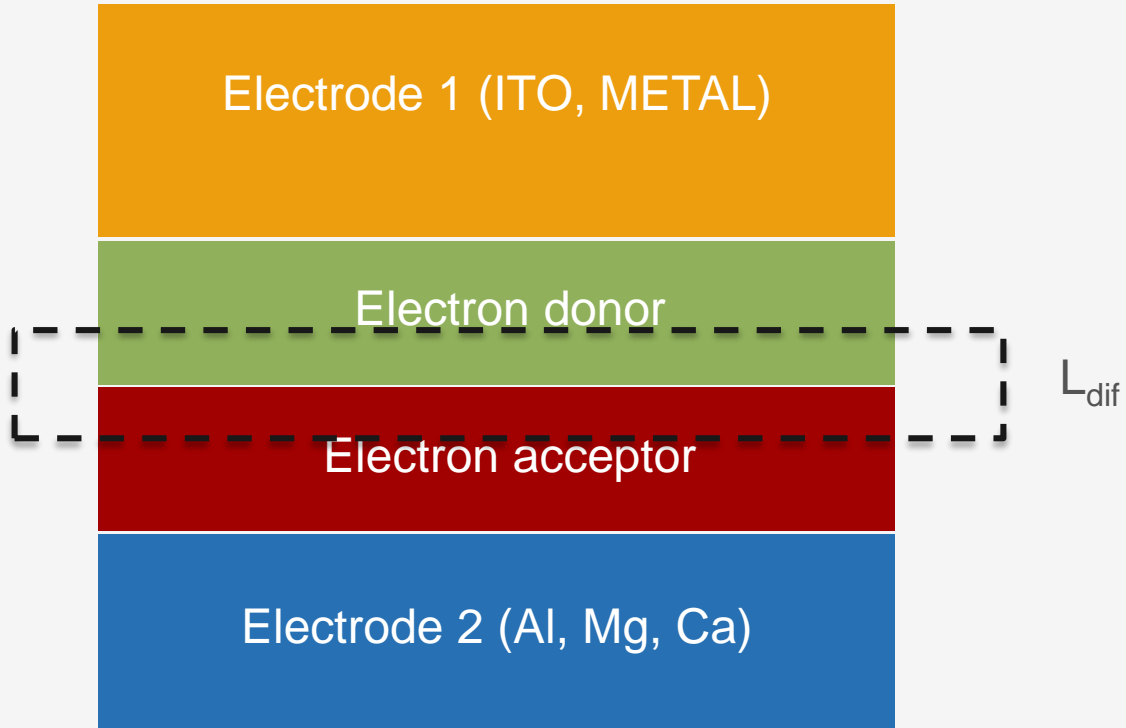
Electron donor and acceptor materials



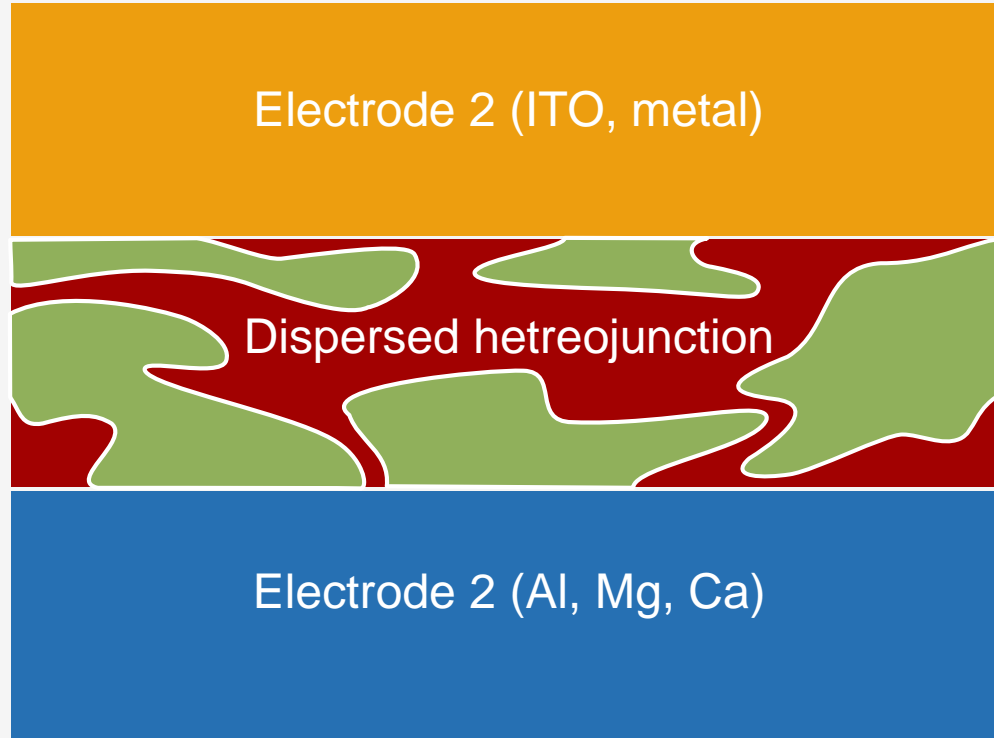
Electron donor and acceptor materials

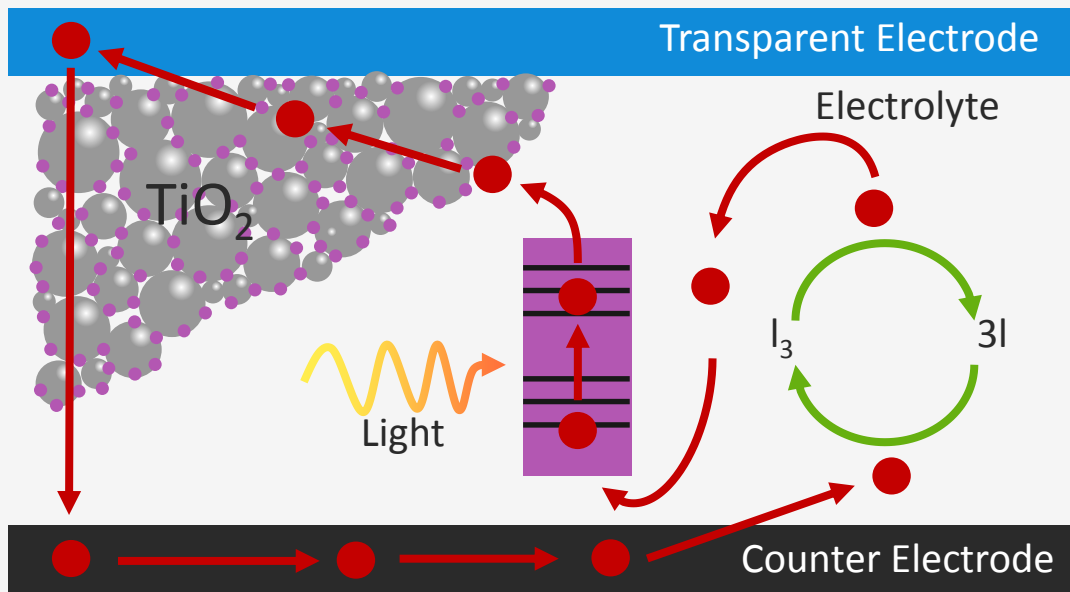
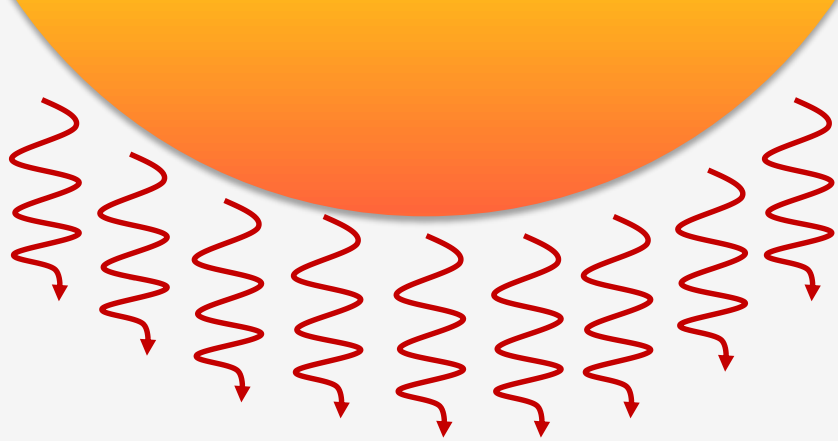


Organic solar cell

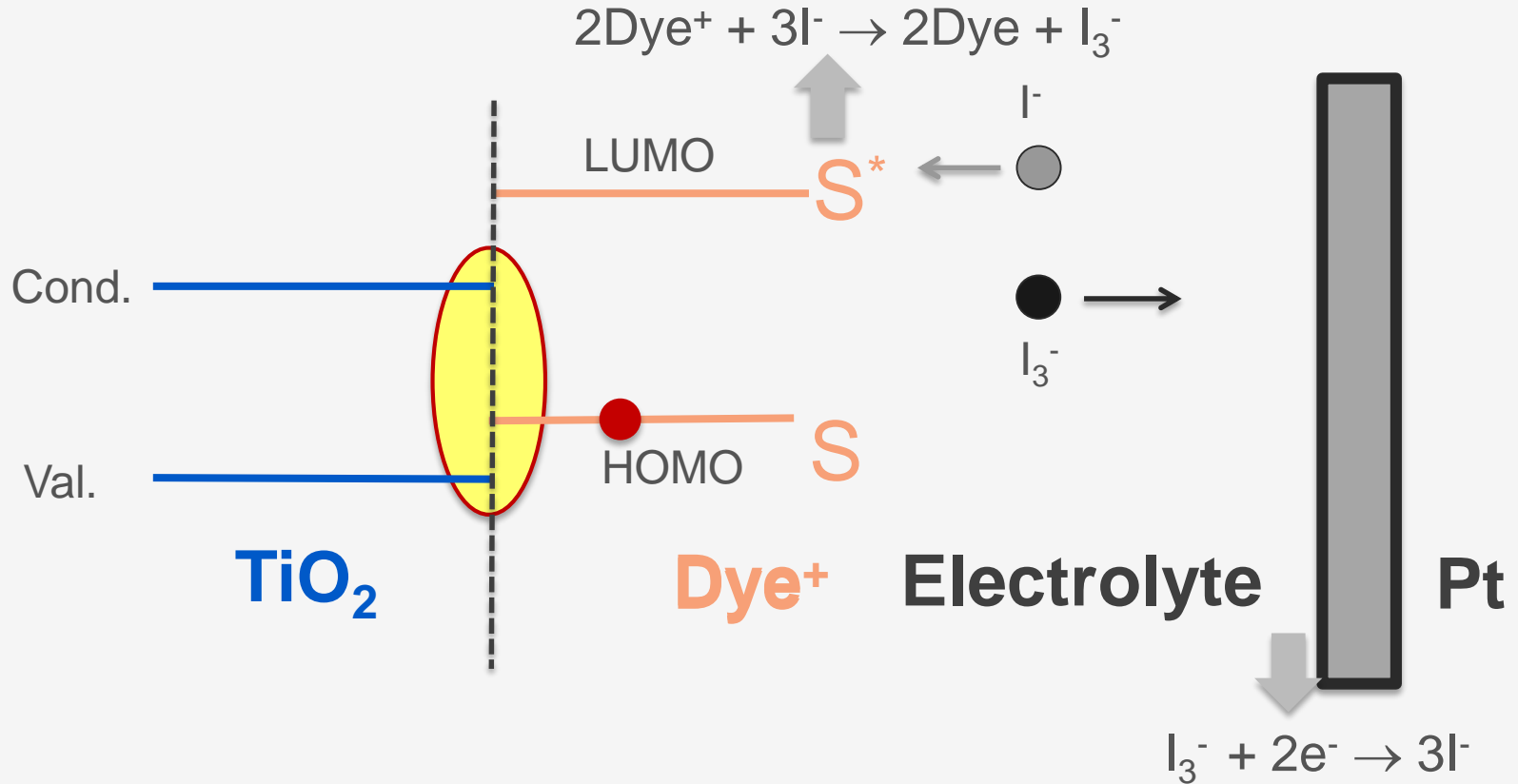


Bulk Heterojunction Organic solar cell





Principle of Dye Sensitized Solar Cell



Dye-Sensitized Solar Cells

