

Solution Plasma Catalyst for CH Activation

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Solution plasma (SP) is one of non-thermal plasma in the liquid phase. SP provides us a kind of catalyst role. The energy levels of SP corresponds to ca. 1 eV for electron donor level and ca. 7 eV for electron acceptor level. The energy levels are related to the electron energy in plasma and plasma potential. Thus the energy levels are identified by plasma and solution.

SP catalytic reactions are governed by two potentials: reduction and oxidization potentials. SP can demonstrate vacuum ultraviolet light photocatalyst, which induces the novel reactions in the atmosphere.

The SP catalyst can realize selective reactions in reactants molecules in organic and aqueous solution, eg., C-H activation linking with cyclic organics, reduction reactions for transition metals complex. In these reactions, the primary reaction pathway is charge transfers (CTs) at the interface of plasma and solution, not the reactions in plasma. The reaction pathway from occupied molecular orbitals (MOs) of reactants to plasma and from plasma to un-occupied MOs. The CTs reactions produce the cation radicals in the solution.

We present the synthesis of the hetero-graphenes for conductive materials, semiconductor, quantum dots with CH activation reaction induced by SP catalyst.

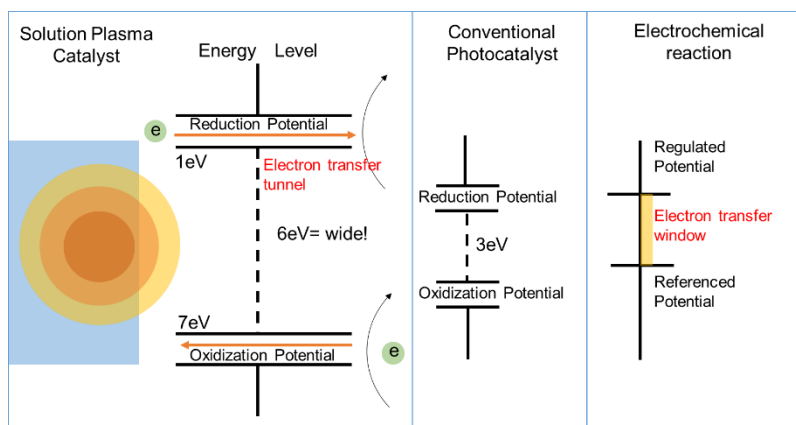


Fig.1 Solution Plasma Catalyst

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