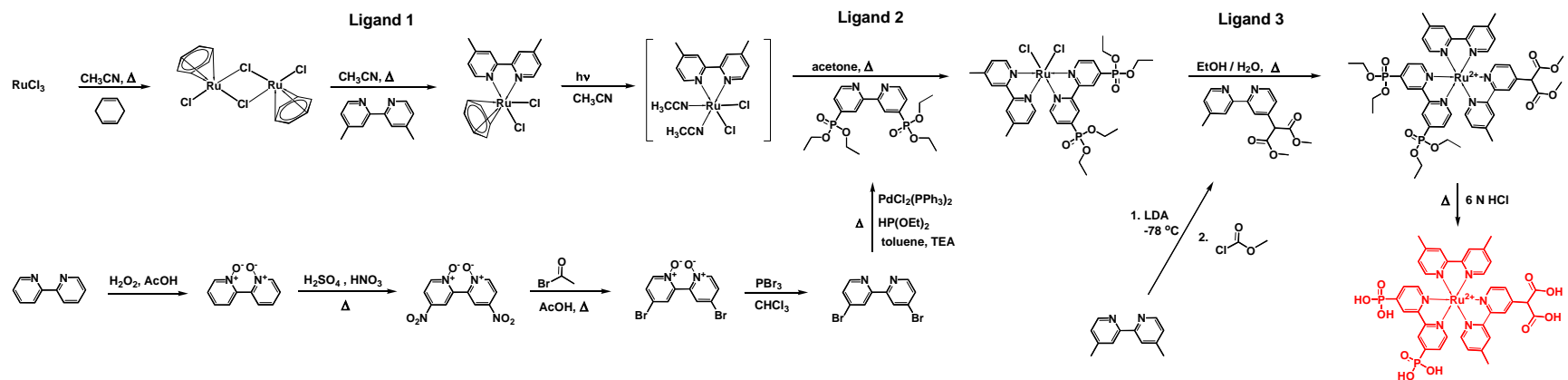
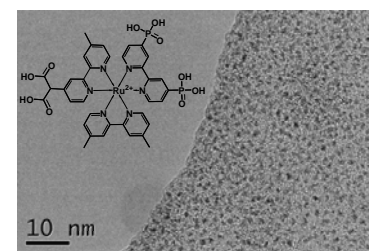


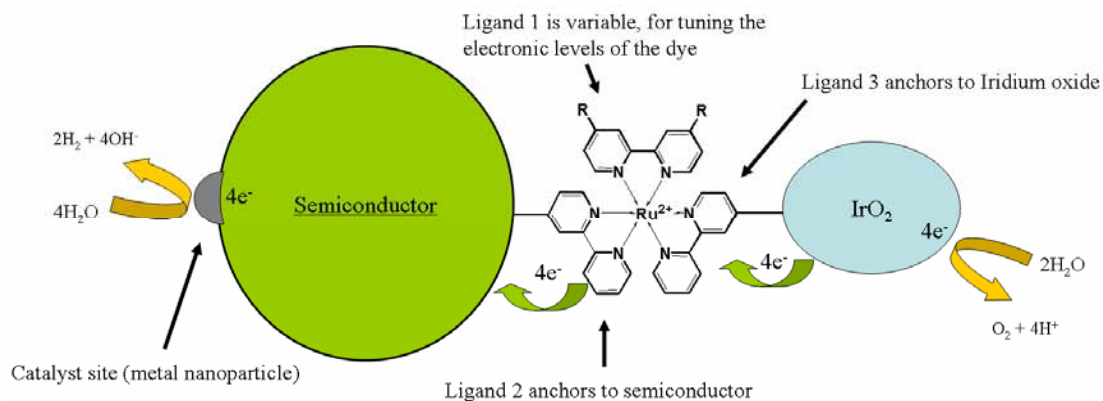
Heteroleptic tris-bipyridyl Ruthenium complexes as photosensitizers for overall photocatalytic water-splitting



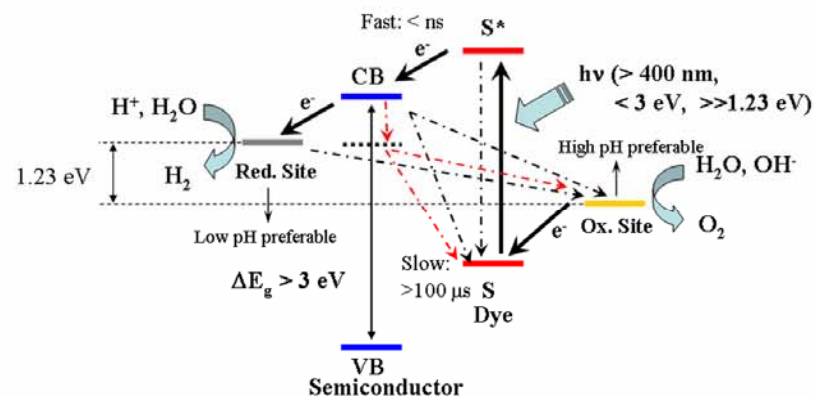
We have synthesized heteroleptic Ruthenium tris-bipyridyl dyes for use as photosensitizers and to form electrochemical contact between a water-oxidizing material (Iridium oxide) and a water-reducing material (Titanium dioxide or Niobium oxide). We have demonstrated the water-oxidation capability of the photosensitized Iridium oxide using a sacrificial electron-acceptor (persulfate). We have assembled colloidal dispersions of the overall photocatalytic systems and are measuring the transient photochemistry of the system(s) to determine the kinetics of electron transport between the Ruthenium tris-bipyridyl dye and each of the metal oxides. Further studies are being conducted to demonstrate overall water-splitting by these new materials in the absence of sacrificial electron donors and/or acceptors, both as free colloidal dispersions in water, and as electrode films.



Heteroleptic Dye - IrO₂



Idealized depiction of water-splitting system



Actual parameters of the system are complex