

PHOTOCHEMICAL AND PHOTOPHYSICAL PROPERTIES OF
TRIS(α,α' -DIIMINE)Ru(II) PHOTSENSITIZERS IN
MICROHETEROGENEOUS MEDIA

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The photophysical and photochemical properties of tris(α,α' -diimine)-ruthenium(II) complex cations in microheterogeneous media have received much attention in connection with achieving efficient solar energy conversion and with using the photosensitizers as probes for microenvironments. In this presentation, I report the results of our works on the photochemistry and photophysics of the eight Ru(II) complexes in micellar and polyelectrolyte solutions. The strong dependences of the interaction between the metal complexes and microparticles and the resultant changes in properties of the metal complexes on the hydrophobic character of the ligands of the metal complexes and the conformation of the polyelectrolytes are demonstrated.

The dependence of the photophysical and photochemical properties of tris(4,4'-dicarboxy-2,2'-bipyridine)Ru(II) complex on pH is also presented and explained in terms of acid-base chemistry of carboxyl groups and oxidation potential of the excited state complex. Also, I report the photosensitized two-electron reduction of viologens and stabilization of the neutral viologens against reactions with water upon addition of β -cyclodextrin or covalently binding the viologen to β -CD.

1. For the results in micellar solutions, see, Park et al., *Bull. Korean Chem. Soc.* **1991**, *12*, 687.
2. For the results in polyelectrolyte solutions, see; Park et al., *Bull. Korean Chem. Soc.* **1985**, *6*, 287; *ibid*, **1986**, *7*, 137; *ibid*, **1990**, *11*, 552; *J. Phys. Chem.* **1993**, *97*, 5424.
3. For the results of tris(4,4'-dicarboxy-2,2'-bipyridine)Ru(II), see; Park et al., *J. Photochem. Photobiol. A: Chem.* **1995**, *86*, 89.
4. For photosensitized two-electron reduction of viologen and the reactivity of neutral viologens, see; Park et al., *Chemistry Lett.*, **1994**, 2075.