# PTA-based ruthenium complexes as photosensitizers for dye-sensitized solar cells

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Two novel ruthenium complexes are synthesized, photo-characterized and tested as photosensitizers in dye-sensitized solar cells (DSCs): [RuCl2(mPTA)3(H2O)](CF3SO3)3 (C1) (m: methyl; PTA: 3,5,7-triaza-phosphaadamantane) and [Ru(C = C=CPh2)Cp(PTA)(PPh3)](CF3SO3) (C2). The complexes are soluble in organic solvents and, interestingly, in water, which makes them useful for water-based photochemical processes. They possess excellent photon-absorption over a wide range of the spectrum with intense peaks at ? 330 nm for both sensitizers. A second peak is found for C2 at 525 nm, wider than the corresponding to the N719 standard dye. DSCs using these sensitizers are evaluated against different electrolytes. The solar cell performance was similar for both complexes and strongly dependent on the electrolyte nature, with a maximum conversion efficiency of 0.32% for the iodide/triiodide electrolyte. 

Dye

PTA

Ruthenium complex

Sensitizer

Solar cell

Absorption spectroscopy

Dyeing

Electrolytes

Photosensitizers

Ruthenium compounds

Solar cells

Synthesis (chemical)

Iodide/tri-iodide

Photochemical process

Photon absorptions

Ruthenium complexes

Sensitizer

Solar cell performance

Water based

Dye-sensitized solar cells

electrolyte

organic solvent

photosensitizing agent

ruthenium complex

absorption

Article

chelation

controlled study

light absorption

photochemistry

priority journal

short circuit current

synthesis

topography