

Accepted Manuscript

Research paper

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B. Chowdhury, K. Naskar, D. Mallick, K.K. Sarkar, C. Sen, C. Sinha

PII: S0020-1693(18)30169-5
DOI: <https://doi.org/10.1016/j.ica.2018.07.053>
Reference: ICA 18399

To appear in: *Inorganica Chimica Acta*

Received Date: 29 January 2018
Revised Date: 27 July 2018
Accepted Date: 30 July 2018

Please cite this article as: B. Chowdhury, K. Naskar, D. Mallick, K.K. Sarkar, C. Sen, C. Sinha, Photochromism of {Bis(diphenylphosphino)methane}(1-alkyl-2-(arylo) imidazole)Silver(I) hexafluorophosphate complexes, *Inorganica Chimica Acta* (2018), doi: <https://doi.org/10.1016/j.ica.2018.07.053>

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Photochromism of {Bis(diphenylphosphino)methane}(1-alkyl-2-(arylo)imidazole)Silver(I) hexafluorophosphate complexes

B. Chowdhury^{a†}, K. Naskar^a, D. Mallick^{b*}, K. K. Sarkar^c, C. Sen^d and C. Sinha^{a*}

^aDepartment of Chemistry, Jadavpur University, Kolkata – 700 032, India.

^bDepartment of Chemistry, Mrinalini Datta Mahavidyalaya, Kolkata - 700 051, India.

^cDepartment of Chemistry, Mahadevananda Mahavidyalaya, Kolkata - 700 120, India.

^dDepartment of Chemistry, Sripat Singh College, Jiaganj, Murshidabad, West Bengal, India

ABSTRACT

The coordinated 1-alkyl-2-(arylo)imidazole (RaaiR') in [Ag(μ -dppm)(RaaiR')]₂(PF₆)₂ (dppm, bis-(diphenylphosphino)methane) undergoes light induced *trans*-to-*cis* isomerization about –N=N– bond. The quantum yields ($\phi_{t \rightarrow c}$) of *trans*-to-*cis* isomerization of coordinated RaaiR' in the complex is lower than the free ligand data. The reverse transformation, *cis*-to-*trans*, is carried out at different temperatures (298 – 313 K) and activation energy (E_a) has been calculated. It is found that E_a (free ligands) > E_a (coordinated ligand in the complexes). The structures of the complexes have been established by spectral (UV-Vis, IR, and ¹H-NMR) data. One of the complexes, [Ag(μ -dppm)(HaaiEt)]₂(PF₆)₂ has been structurally confirmed by single crystal X-ray diffraction study.

Keywords: Aryloimidazole, bridging bis-(diphenylphosphino)methane, Ag(I) hexafluorophosphate complexes, spectral study, photochromism

[†] Present Address : Department of Chemistry, Rishi Bankim Chandra College, East

Kantalpara, North 24 Parganas, Naihati, West Bengal 743165

* Corresponding author. Tel.: +91 94333621872; fax: +91 033 2414 6584.

E-mail address: crsjuchem@gmail.com (C. Sinha). dmchemmdm51@gmail.com (D. Mallick)

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