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Review

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Sarbjeet Kaur, Mandeep Kaur, Paramjit Kaur, Koen Clays, Kamaljit Singh

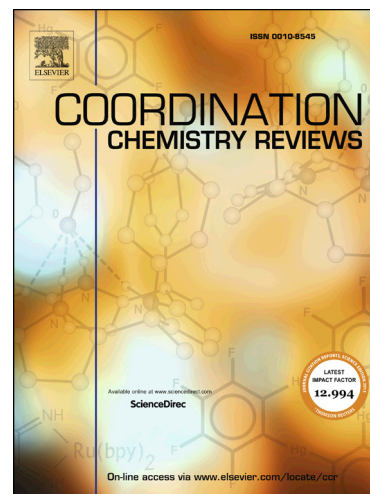
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Ferrocene chromophores continue to inspire. Fine-tuning and switching of the second-order nonlinear optical response

Sarbjeet Kaur,^a Mandeep Kaur,^a Paramjit Kaur,^{*a} Koen Clays^b and Kamaljit Singh^{*Ψ,a}

^aDepartment of Chemistry, Centre of Advance Study-II, Guru Nanak Dev University, Amritsar –143 005, India (E-mail: Kamaljit Singh: kamaljit.chem@gndu.ac.in)

^bDepartment of Chemistry, University of Leuven, Celestijnenlaan 200D, B-3001 Leuven, Belgium (E-mail: Koen Clays: Koen.Clays@fys.kuleuven.be)

Abstract:

Fine tuning and switching the electronic properties of ferrocene chromophores has been an area of considerable significance and a plethora of new ferrocene-based chromophores with new properties are continually being reported in the current literature. Depending upon the oxidation state of the iron metal centre and/or on the chemical constitution, the ferrocene unit in its chromophore behaves as an extremely strong donor or acceptor. This property has been extensively used in fine-tuning the electronic properties of organometallic chromophores. Suitably functionalized *push-pull* chromophores (D- π -A) in which an electron donor (D) ferrocene is connected by a π -conjugated spacer to a strong electron acceptor (A), have gathered significant interest for their synthesis, (spectro)electrochemical, and switchable optical and second-order nonlinear optical properties. These materials exhibit structure-based large second-order optical nonlinearities and are potentially useful for applications related to telecommunications, optical computing, optical storage, and optical information processing. In this review, these aspects of ferrocene chromophores have been presented and structure-property correlations have been drawn.

Key words: Ferrocene; nonlinear optics; chromophores; second harmonic generation; hyper Rayleigh scattering; electrochemistry.

^ΨCorresponding author. Tel: +91-183-2258802-09 Extn 3508; Fax: +91-183-2258819-20. E-mail: kamaljit.chem@gndu.ac.in (K. Singh).

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