

Cross Conjugated Chromophores Based On Indigo Typed

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Abstract: The majority of dyes belong to the chromophoric class known as *donor-acceptor systems*, the essential structural feature of such systems being the presence of one or more electron donating groups conjugated to one or more electron withdrawing groups *via* an unsaturated bridge. The indigo molecule may be formally divided into two identical electron donor/acceptor subsystems, each containing an additional number of pi electrons, two subsystems being joined by carbon-carbon double bond. Indigoid type dyes which show a strong colour change on protonation or dissociation have many potential functional applications, for example as analytical pH indicators, solvent polarity indicators, and in various imaging and reprographic systems.

1. Introduction

Indigo is the classical example of a dye containing a cross conjugated chromophore. (Figure 1). Cross conjugation describes a pi electron system with two sets of electron donor/electron acceptor in opposition conjugating over one or more common pi bonds.

The inherent cross conjugation of the molecule has been recognised as being responsible for high bathochromicity of these pi systems. Klessinger has designated this system a H-Chromophore because of its structure geometry.

2. Results and Discussion

For those dyes which had measurable solubility in water, their pH colour change was determined by adding dilute hydrochloric acid or dilute sodium hydroxide solution to an aqueous solution of the dye until any spectral changes were complete.

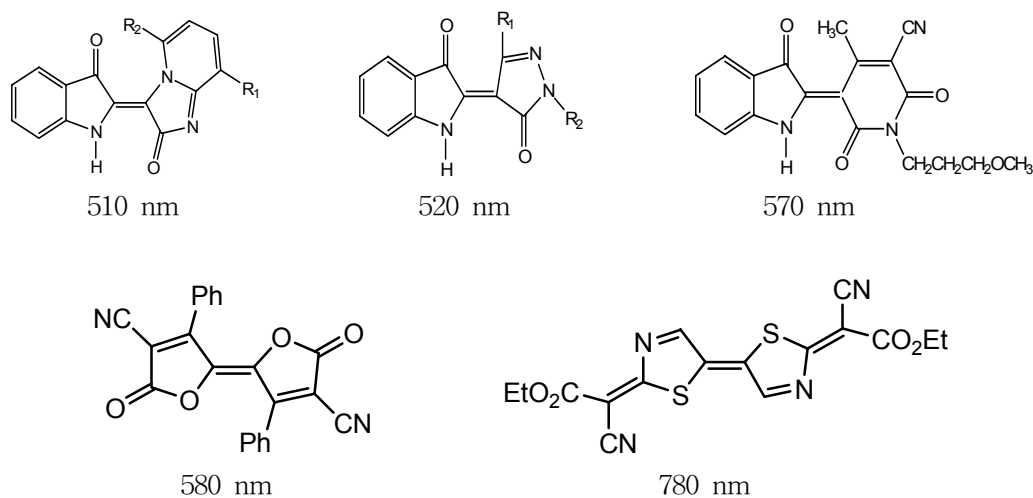


Figure 1.

To measure the spectra of the acidic and basic forms of these dyes, and the water insoluble dyes, in methanol solution could be adopted a similar procedure.

For water immiscible solvents the isolated neutral form of the dye could dissolved in the solvent and after measuring the spectrum dilute aqueous acid could be added with vigorous shaking until protonation was complete. The spectrum was measured after the organic phase had cleared. The reversibility of the colour change processes was confirmed by adding acid or base, as appropriate, and the spectral plots showed a distinct isosbestic point.

3. Conclusion

To syntheses a range of cross-conjugated donor-acceptor chromophores, analogous to indigo

To examine their colour change properties, particularly pH changes and oxidation-reduction effects

References

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