

MQPI

Thermotropic Liquid-Crystalline and Light-Emitting Properties of bis(4-Aalkoxyphenyl) Viologen bis(Triflimide) Salts

Pradip K. Bhowmik ^{1,*}, Muhammed Kareem M. Al-Karawi ¹, Shane T. Killarney ¹, Erenz J. Dizon ¹, Anthony Chang ¹, Jongin Kim ¹, Si L. Chen ¹, Ronald Carlo G. Principe ¹, Andy Ho ¹, Haesook Han ¹, Hari D. Mandal ², Raymond G. Cortez ², Bryan Gutierrez ², Klarissa Mendez ², Lewis Sharpnack ³, Deña M. Agra-Kooijman ⁴, Michael R. Fisch ⁵ and Satyendra Kumar ⁶

- ¹ Department of Chemistry and Biochemistry, University of Nevada Las Vegas, 4505 S. Maryland Parkway Box 454003, Las Vegas, NV 89154-4003, USA
- ² Department of Biology and Chemistry, Texas A & M International University, 5201 University Blvd., Laredo, TX 78041, USA
- ³ Department of Earth Science, 1006 Webb Hall, University of California, Santa Barbara, CA 93106, USA
- ⁴ Advanced Materials and Liquid Crystal Institute, Kent State University, Kent, OH 44242, USA
- ⁵ College of Aeronautics and Engineering, Kent State University, Kent, OH 44242, USA
- ⁶ Division of Research, University at Albany, Albany, NY 12222, USA
- * Correspondence: pradip.bhowmik@unlv.edu; Tel.: +1 (702) 895-0885; +1 (702) 895-4072

Molecules 2020, 25, x; doi: FOR PEER REVIEW

www.mdpi.com/journal/molecules



Figure S1. $^1\!\mathrm{H}$ and $^{13}\!\mathrm{C}\,\mathrm{NMR}$ spectra of EV1Cl in CD3OD recorded at room temperature.



Figure S2. ¹H and ¹³C NMR spectra of EV6Cl in CD3OD recorded at room temperature.



Figure S3. $^1\!\mathrm{H}$ and $^{13}\!\mathrm{C}\,\mathrm{NMR}$ spectra of EV8Cl in CD3OD recorded at room temperature.



Figure S4. ¹H and ¹³C NMR spectra of EV10Cl in CD3OD recorded at room temperature.



Figure S5. ¹H and ¹³C NMR spectra of EV12Cl in CD₃OD recorded at room temperature.



Figure S6. ¹H NMR spectrum of EV14Cl in CD3OD recorded at room temperature.



Figure S7. ¹H NMR spectrum of EV16Cl in CD3OD recorded at room temperature.



Figure S8. ¹H NMR spectrum of EV18Cl in CD3OD recorded at room temperature.



Figure S9. ¹H NMR spectrum of EV20Cl in CD3OD recorded at room temperature.



Figure S10. $^1\!\mathrm{H}$ and $^{13}\!\mathrm{C}$ NMR spectra of EV1 in CD3OD recorded at room temperature.



Figure S11. ¹H and ¹³C NMR spectra of EV6 in CD₃OD recorded at room temperature.



Figure S12. ¹H and ¹³C NMR spectra of EV8 in CD₃OD recorded at room temperature.



Figure S13. $^1\!\mathrm{H}$ and $^{13}\!\mathrm{C}$ NMR spectra of EV10 in CD3OD recorded at room temperature.



Figure S14. $^1\!\mathrm{H}$ and $^{13}\!\mathrm{C}$ NMR spectra of EV12 in CD3OD recorded at room temperature.



Figure S15. ¹H and ¹³C NMR spectra of EV14 in *d6*-DMSO recorded at room temperature.



Figure S16. ¹H and ¹³C NMR spectra of EV16 in *d6*-DMSO recorded at room temperature.



Figure S17. ¹H and ¹³C NMR spectra of EV18 in d_6 -DMSO recorded at room temperature.



Figure S18. ¹H and ¹³C NMR spectra of EV20 in d_6 -DMSO recorded at room temperature.



Figure S19. DSC thermograms of EV6 obtained at heating and cooling rates of 10 °C /min.



Figure S20. DSC thermograms of EV12 obtained at heating and cooling rates of 10 $^{\circ}\mathrm{C}$ /min.



Figure S21. DSC thermograms of EV16 obtained at heating and cooling rates of 10 $^\circ\text{C}$ /min.



Figure S22. DSC thermograms of EV18 obtained at heating and cooling rates of 10 $^\circ\text{C}$ /min.



Figure S23. DSC thermograms of EV20 obtained at heating and cooling rates of 10 $^\circ\text{C}$ /min.



Figure S24. TGA thermograms of EV14-EV20 obtained a heating rate of 10 °C/min in nitrogen.



Figure S25. Emission spectra of (a) EV1Cl (b) EV1 in methanol at various excitation wavelengths.

```
22 of 23
```

(a)

(b)



Figure S26. Emission spectra of (a) EV8Cl (b) EV8 in methanol at various excitation wavelengths.

1000

900

800 700

300

400

Intensity (a.u)

(a)

```
205 nm

- - - 215 nm

----- 252 nm

----- 282 nm

----- Monitore
577 nm
                                                                                l at 577 nn
```

700

800

600

512 nm

500 Wavelength (nm)

4.5

(b)



Figure S27. Emission spectra of (a) EV10Cl (b) EV10 in methanol at various excitation wavelengths.