

Supporting Information for:

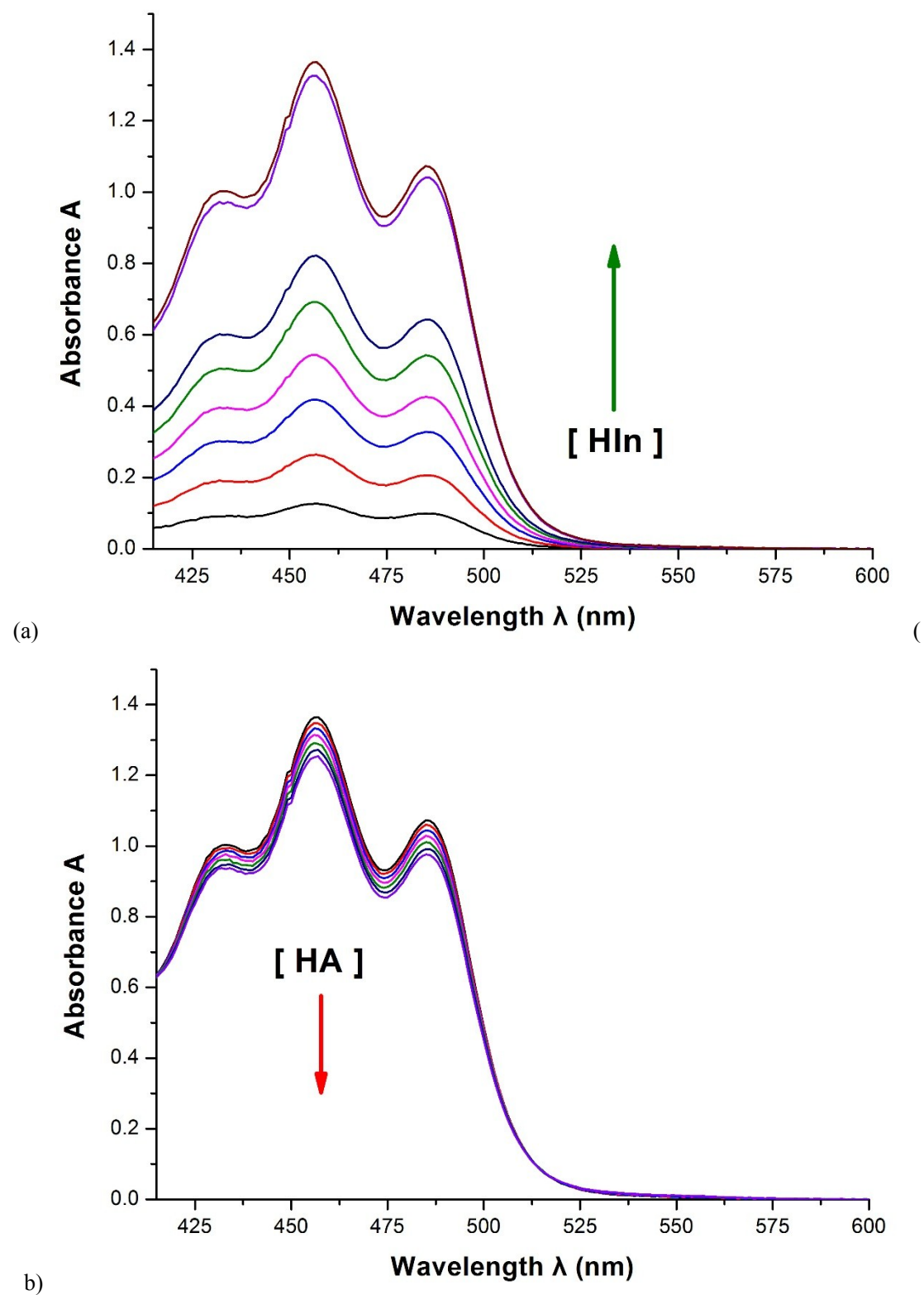
**Equilibrium Acidities of BINOL Type Chiral Phenolic  
Hydrogen Bonding Donors in DMSO**

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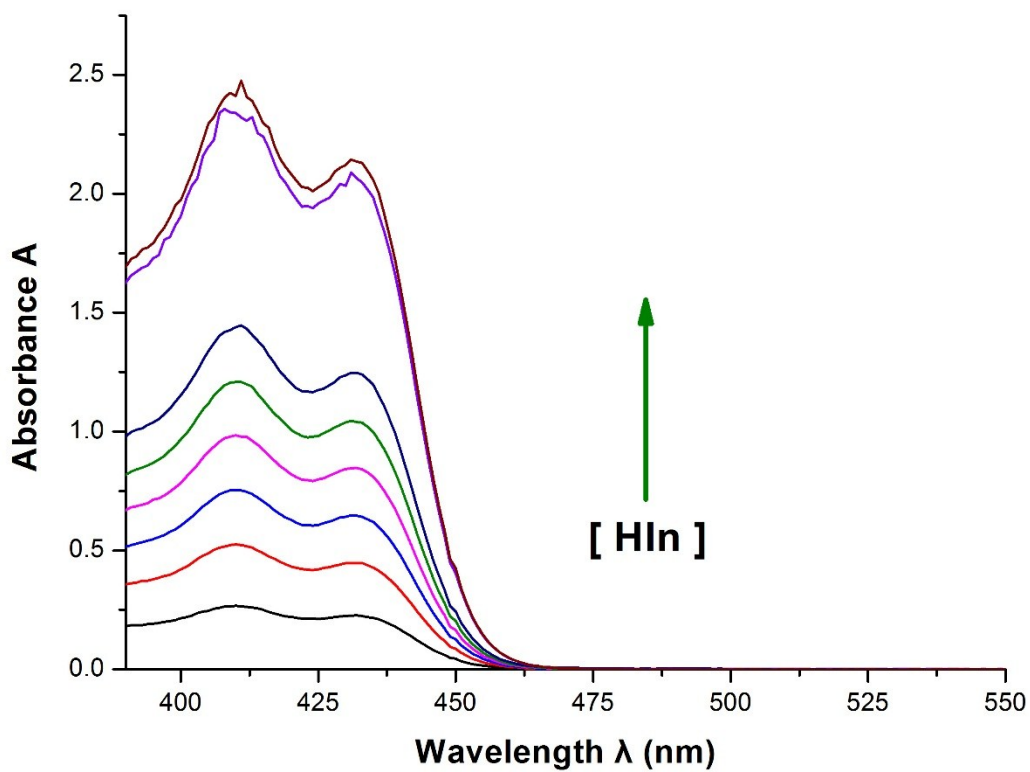
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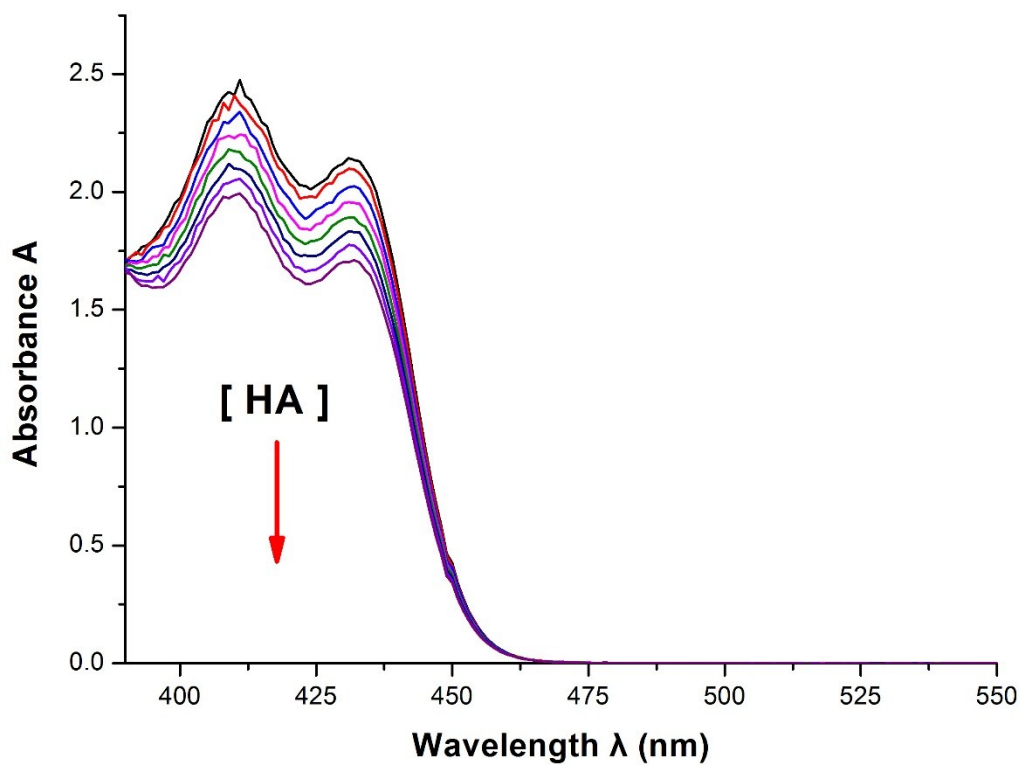
## UV/Vis spectra of the HIn anion in DMSO



**Figure 1.** (a) Absorption spectra of the anion derived from **2,7-diBr-9-PhS-FH** for various added amounts of **2,7-diBr-9-PhS-FH** during the titration. (b) Absorption spectra of the anion derived from **2,7-diBr-9-PhS-FH** for various added amounts of catalyst **2** during the titration.

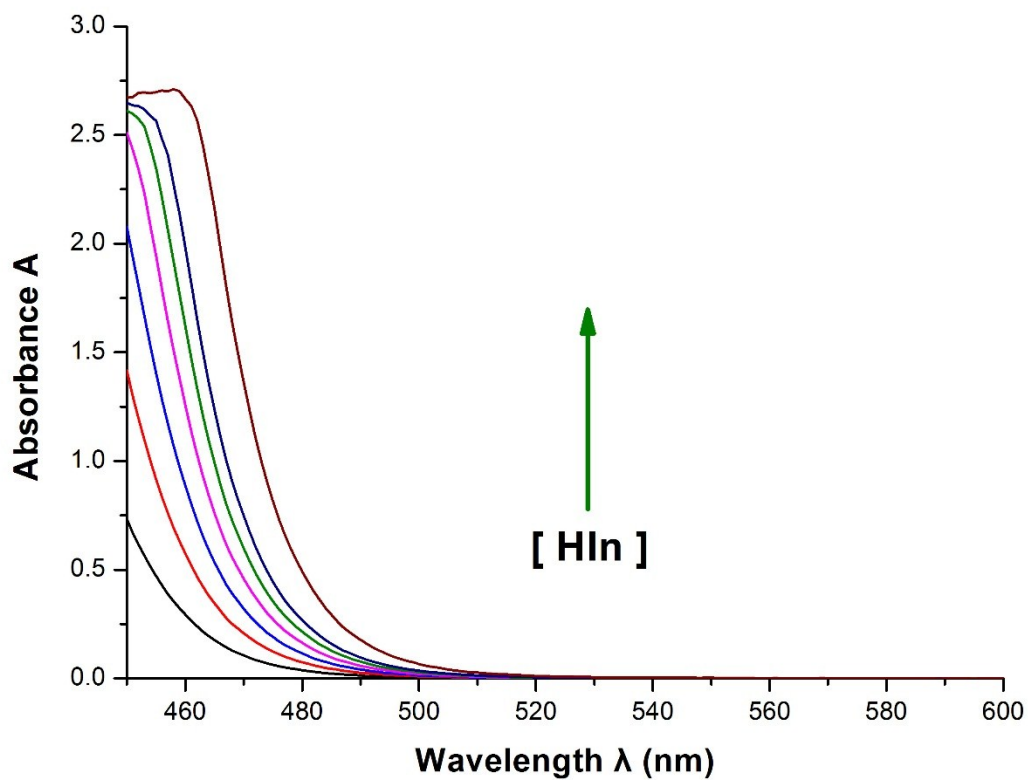


(a)

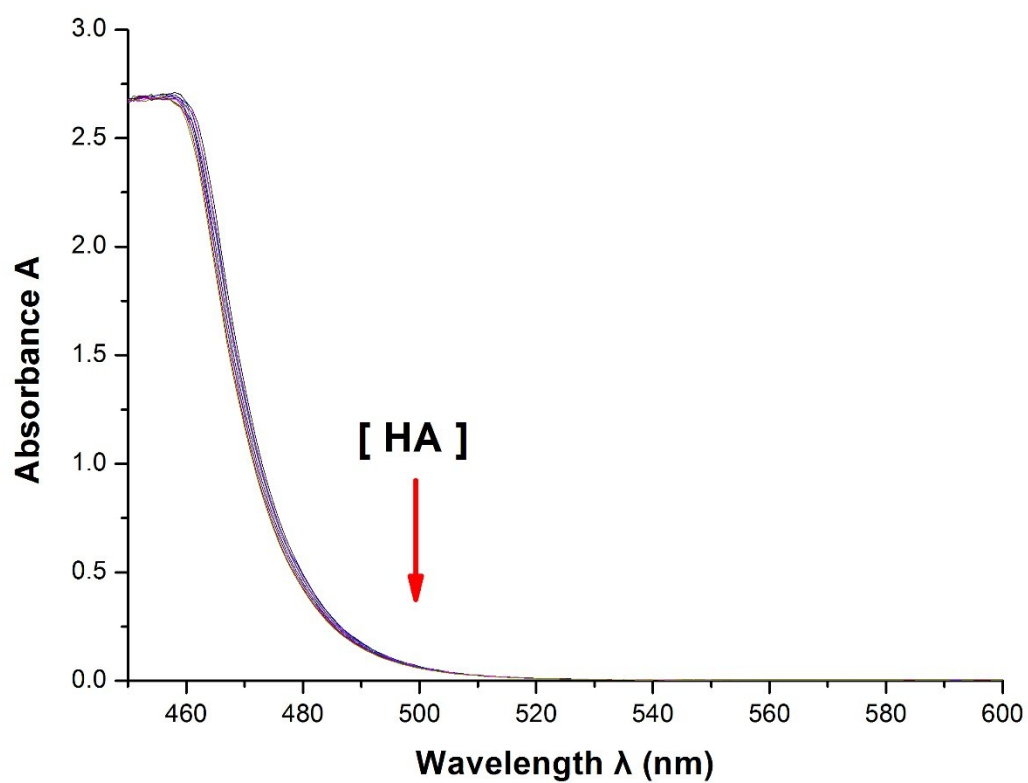


(b)

**Figure 2.** (a) Absorption spectra of the anion derived from 9-CO<sub>2</sub>Me-FH for various added amounts of 9-CO<sub>2</sub>Me-FH during the titration. (b) Absorption spectra of the anion derived from 9-CO<sub>2</sub>Me-FH for various added amounts of catalyst 3 during the titration.

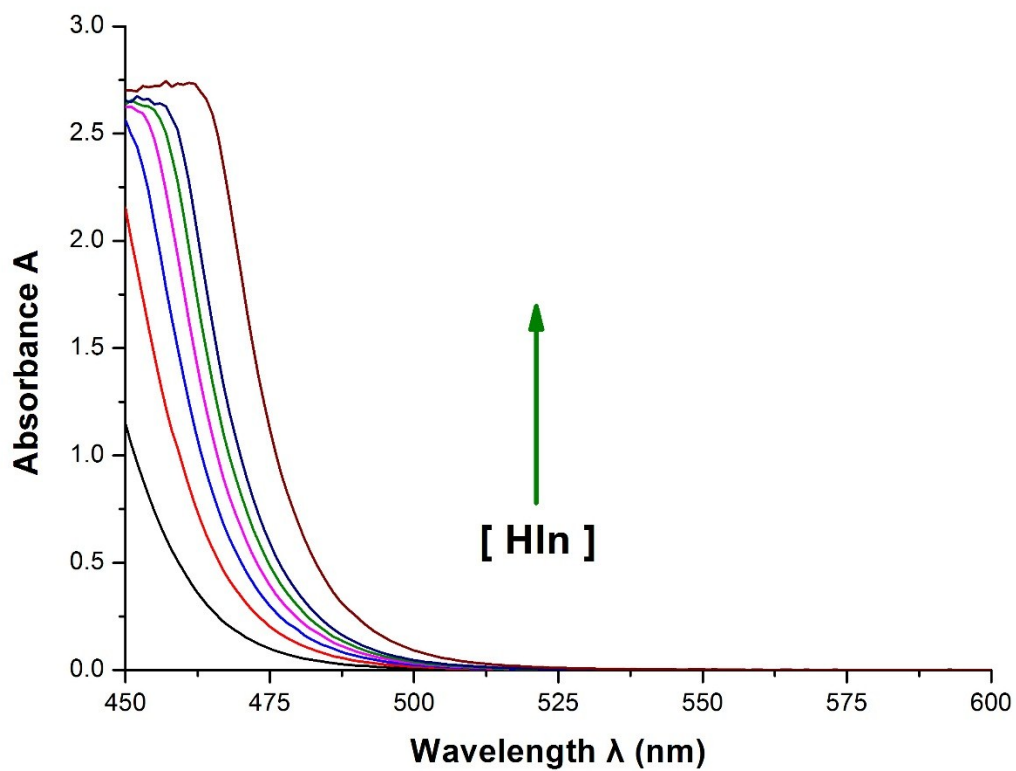


(a)

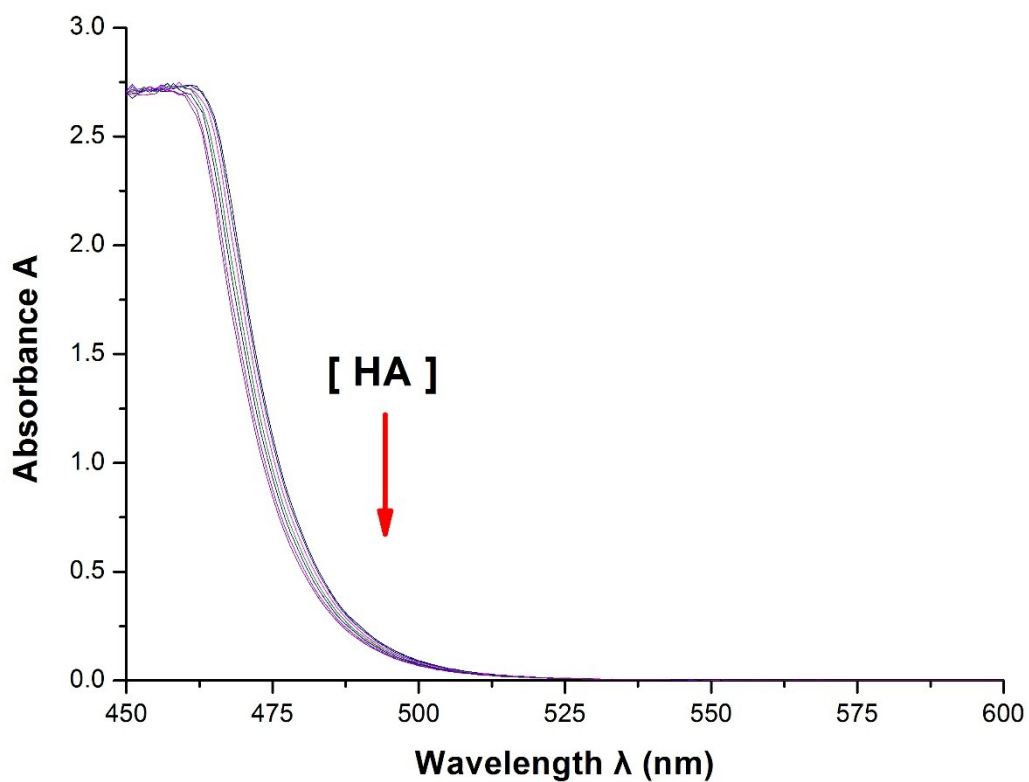


(b)

**Figure 3.** (a) Absorption spectra of the anion derived from **4-NO<sub>2</sub>-3-CF<sub>3</sub>-phenol** for various added amounts of **4-NO<sub>2</sub>-3-CF<sub>3</sub>-phenol** during the titration. (b) Absorption spectra of the anion derived from **4-NO<sub>2</sub>-3-CF<sub>3</sub>-phenol** for various added amounts of catalyst **4** during the titration.

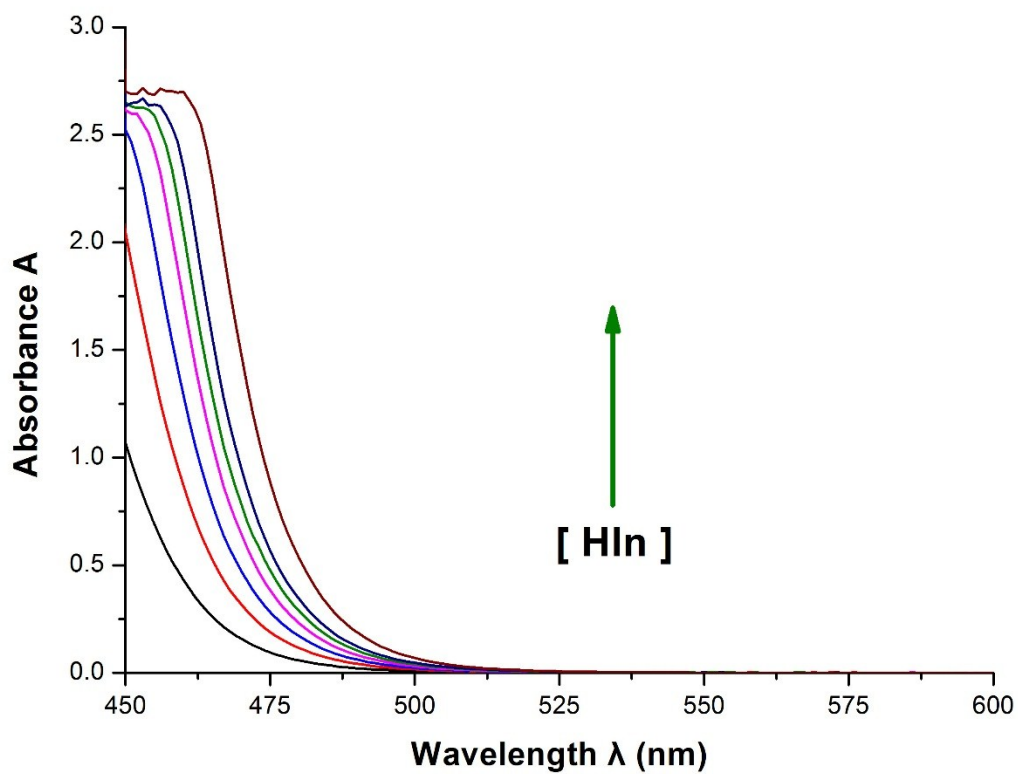


(a)

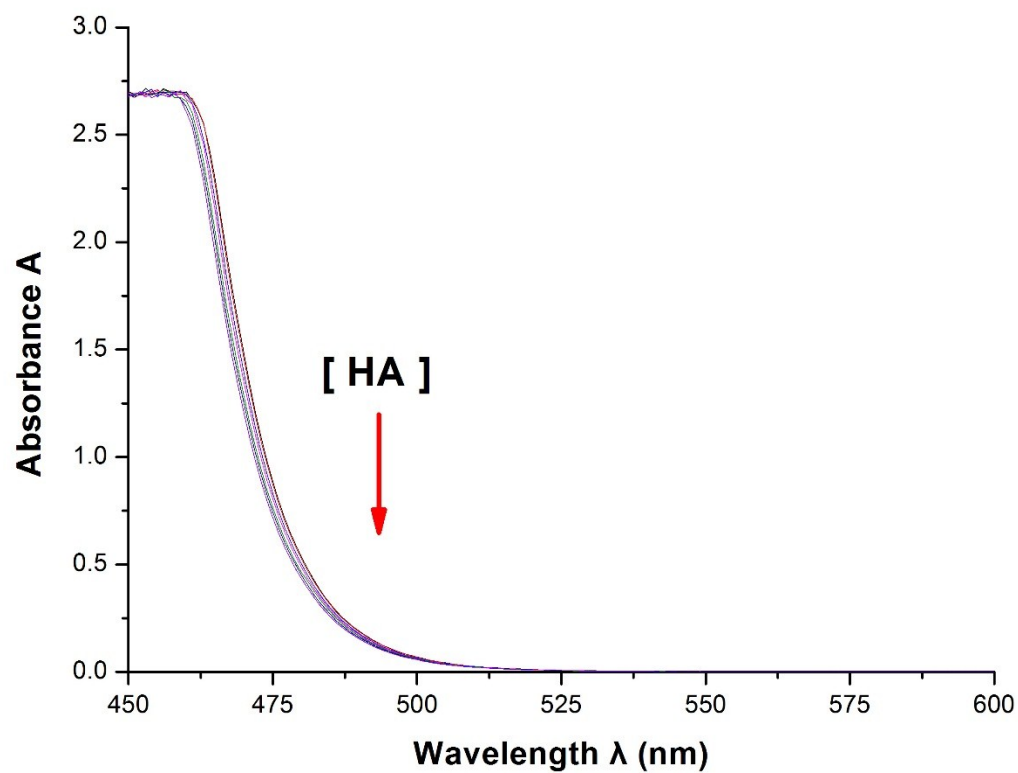


(b)

**Figure 4.** (a) Absorption spectra of the anion derived from **4-NO<sub>2</sub>-3-CF<sub>3</sub>-phenol** for various added amounts of **4-NO<sub>2</sub>-3-CF<sub>3</sub>-phenol** during the titration. (b) Absorption spectra of the anion derived from **4-NO<sub>2</sub>-3-CF<sub>3</sub>-phenol** for various added amounts of catalyst **5** during the titration.

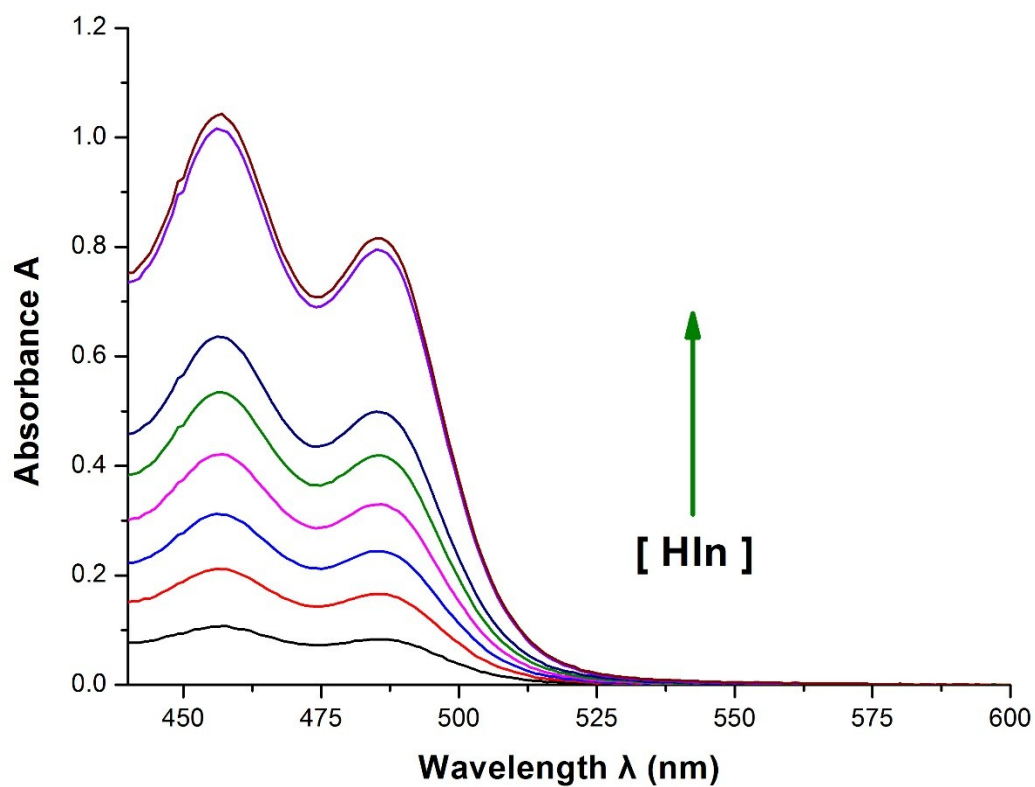


(a)

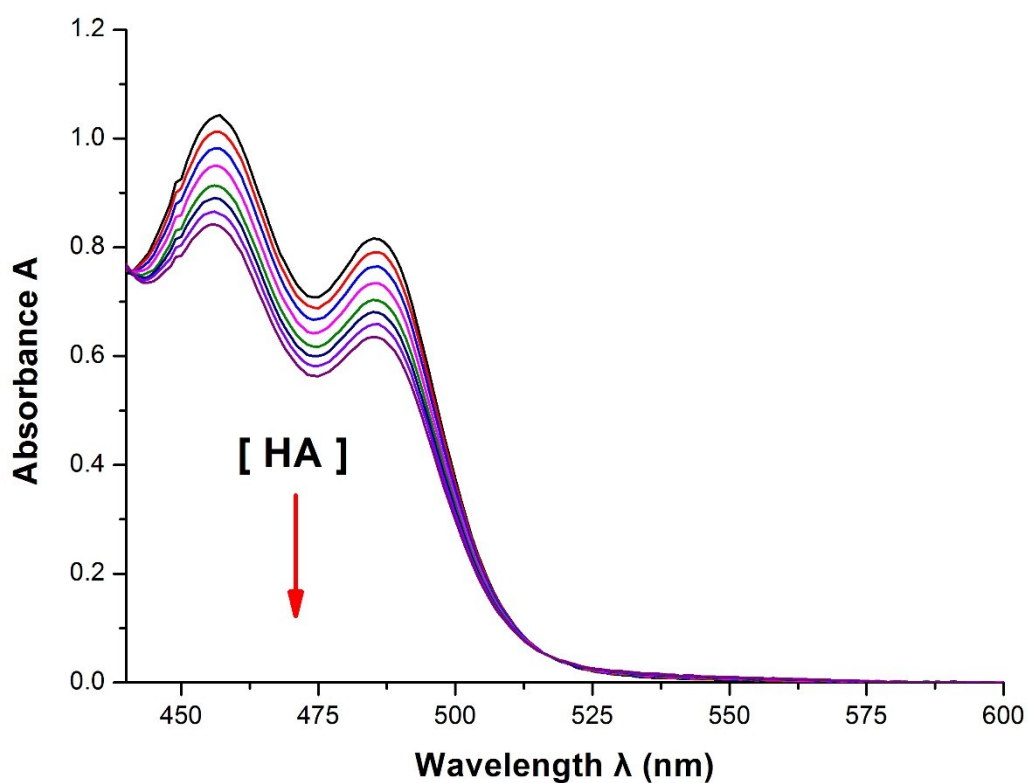


(b)

**Figure 5.** (a) Absorption spectra of the anion derived from **4-NO<sub>2</sub>-3-CF<sub>3</sub>-phenol** for various added amounts of **4-NO<sub>2</sub>-3-CF<sub>3</sub>-phenol** during the titration. (b) Absorption spectra of the anion derived from **4-NO<sub>2</sub>-3-CF<sub>3</sub>-phenol** for various added amounts of catalyst **6** during the titration.

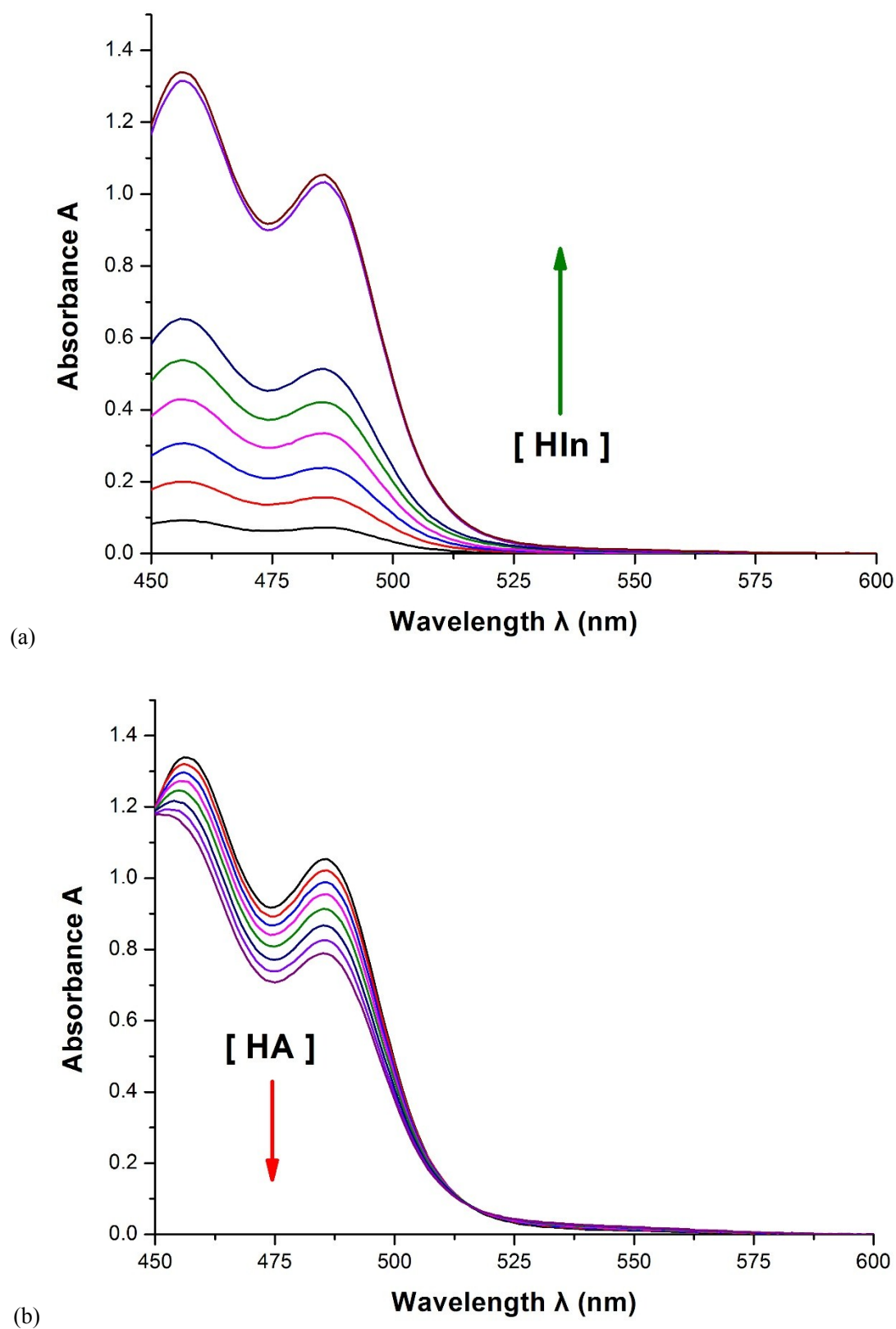


(a)



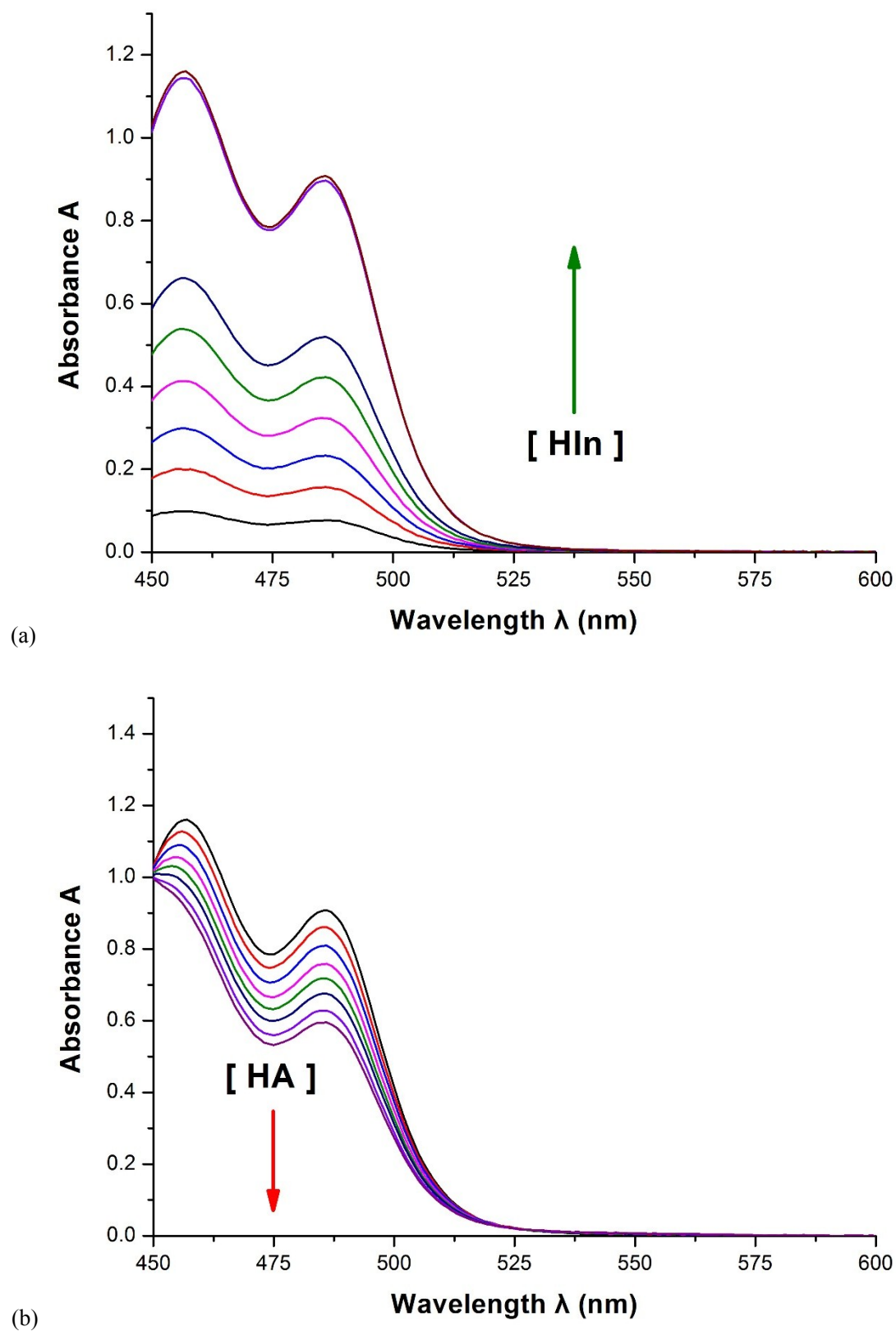
(b)

**Figure 6.** (a) Absorption spectra of the anion derived from 2,7-diBr-9-PhS-FH for various added amounts of 2,7-diBr-9-PhS-FH during the titration. (b) Absorption spectra of the anion derived from 2,7-diBr-9-PhS-FH for various added amounts of catalyst 7 during the titration.

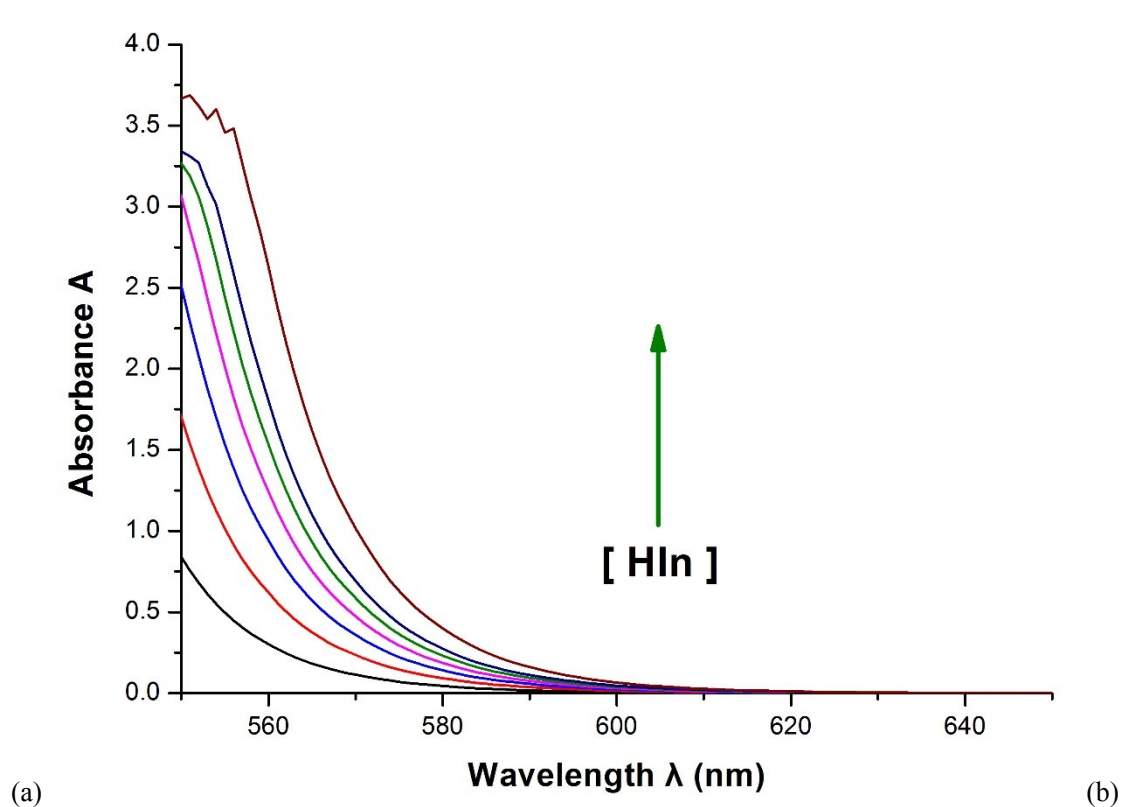


**Figure 7.** (a) Absorption spectra of the anion derived from **2,7-diBr-9-PhS-FH** for various added amounts of **2,7-diBr-9-PhS-FH** during the titration. (b) Absorption spectra of the anion derived from **2,7-diBr-9-PhS-FH** for various added amounts of catalyst **8** during the titration.

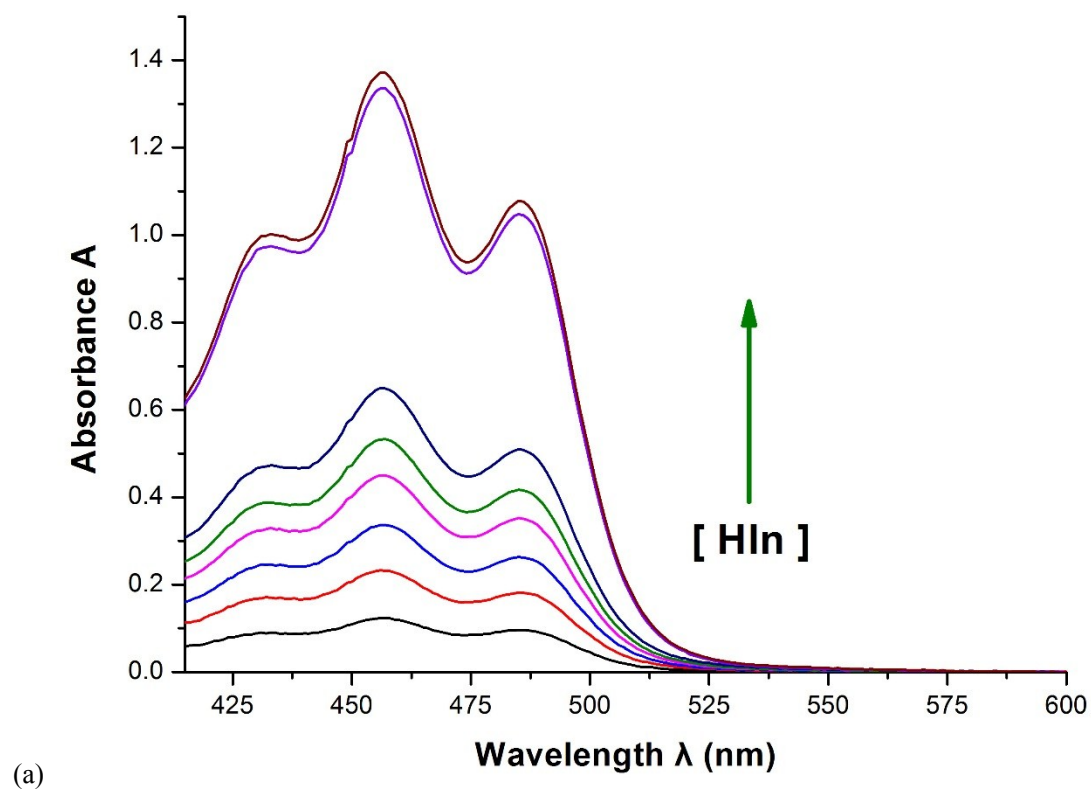


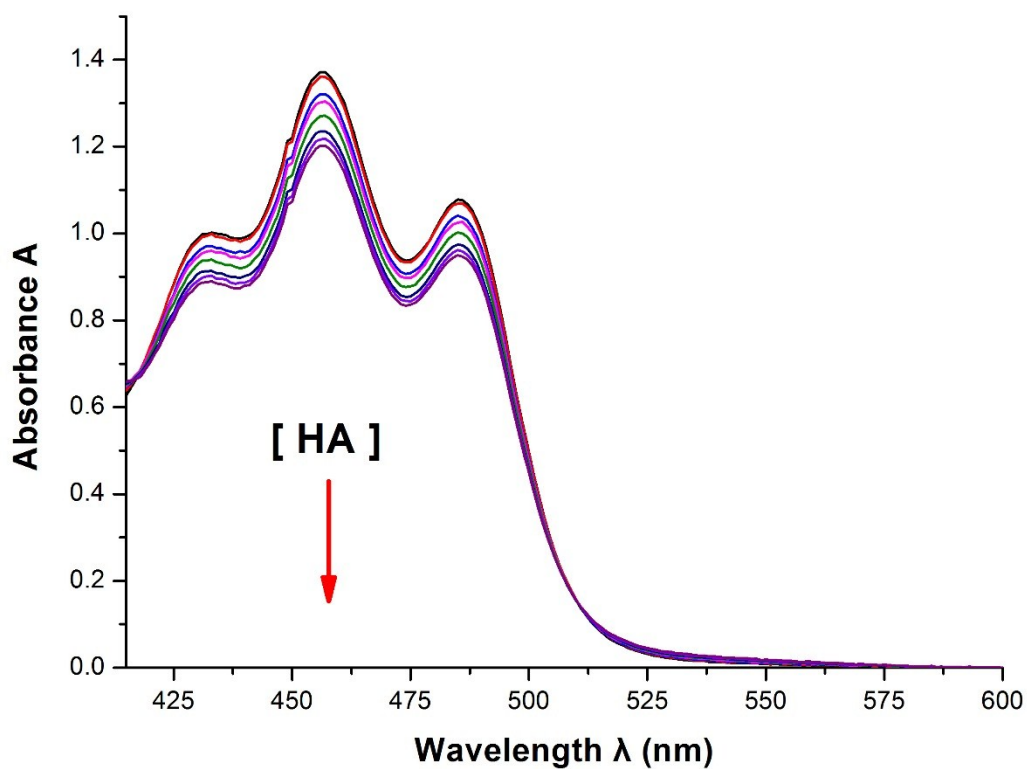


**Figure 8.** (a) Absorption spectra of the anion derived from **2,7-diBr-9-PhS-FH** for various added amounts of **2,7-diBr-9-PhS-FH** during the titration. (b) Absorption spectra of the anion derived from **2,7-diBr-9-PhS-FH** for various added amounts of catalyst **11** during the titration.



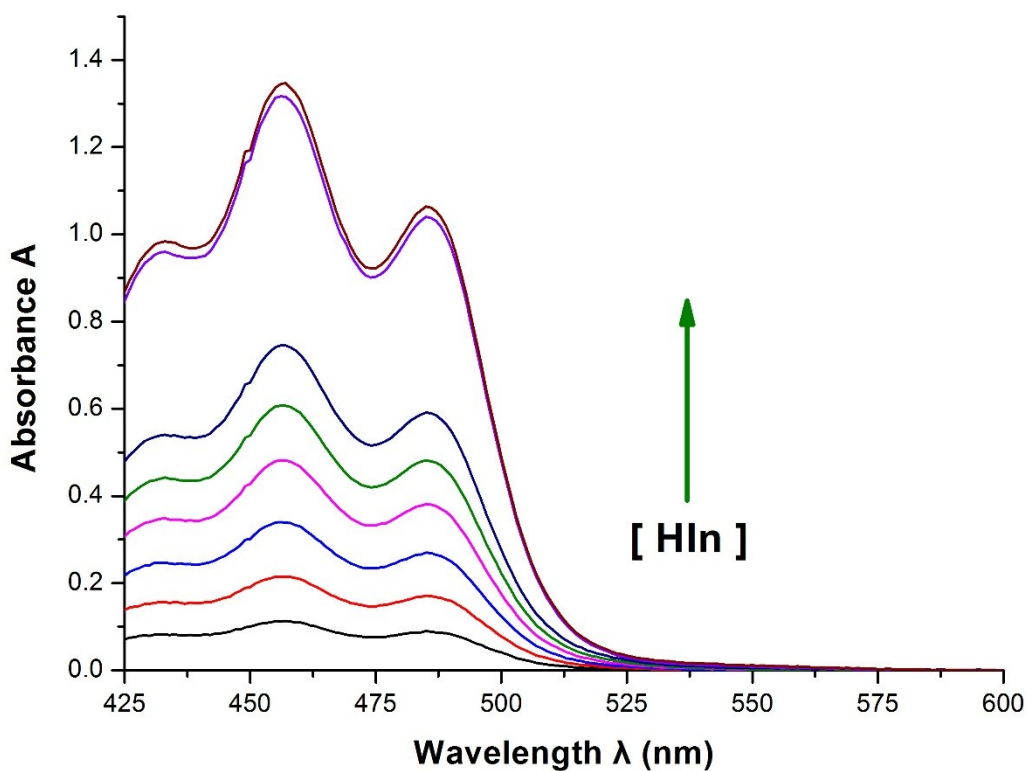
**Figure 9.** (a) Absorption spectra of the anion derived from **9-(2-Cl-Ph)-NHN-FH** for various added amounts of **9-(2-Cl-Ph)-NHN-FH** during the titration. (b) Absorption spectra of the anion derived from **9-(2-Cl-Ph)-NHN-FH** for various added amounts of catalyst **12** during the titration.



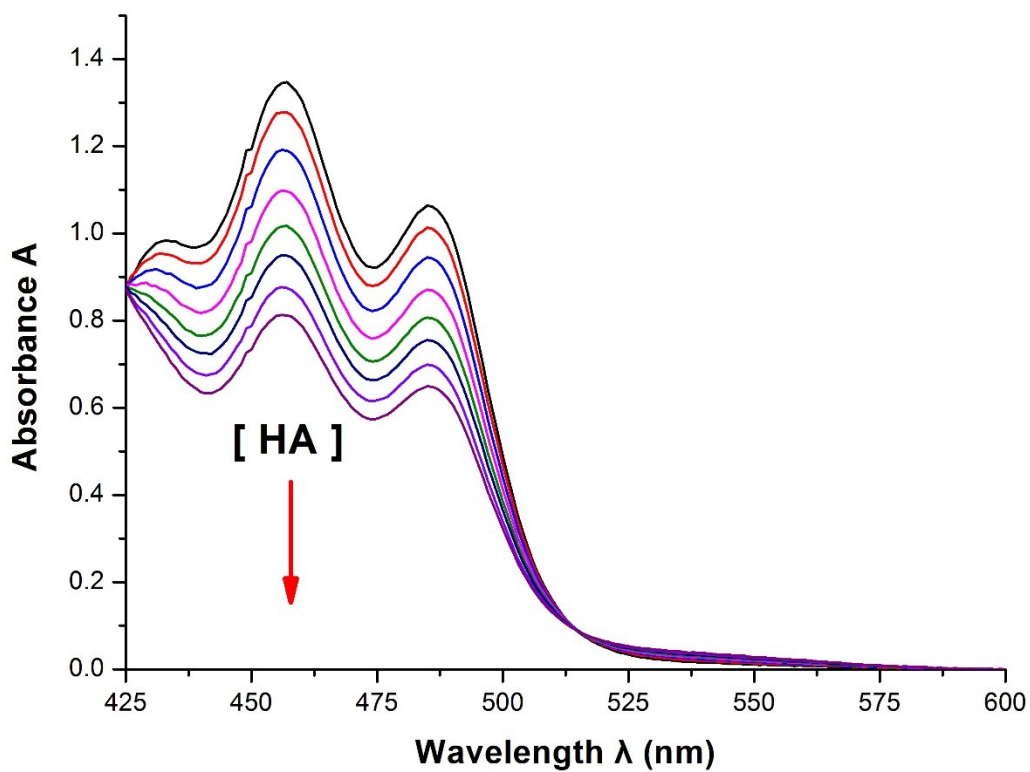


(b)

**Figure 10.** (a) Absorption spectra of the anion derived from **2,7-diBr-9-PhS-FH** for various added amounts of **2,7-diBr-9-PhS-FH** during the titration. (b) Absorption spectra of the anion derived from **2,7-diBr-9-PhS-FH** for various added amounts of catalyst **13** during the titration.

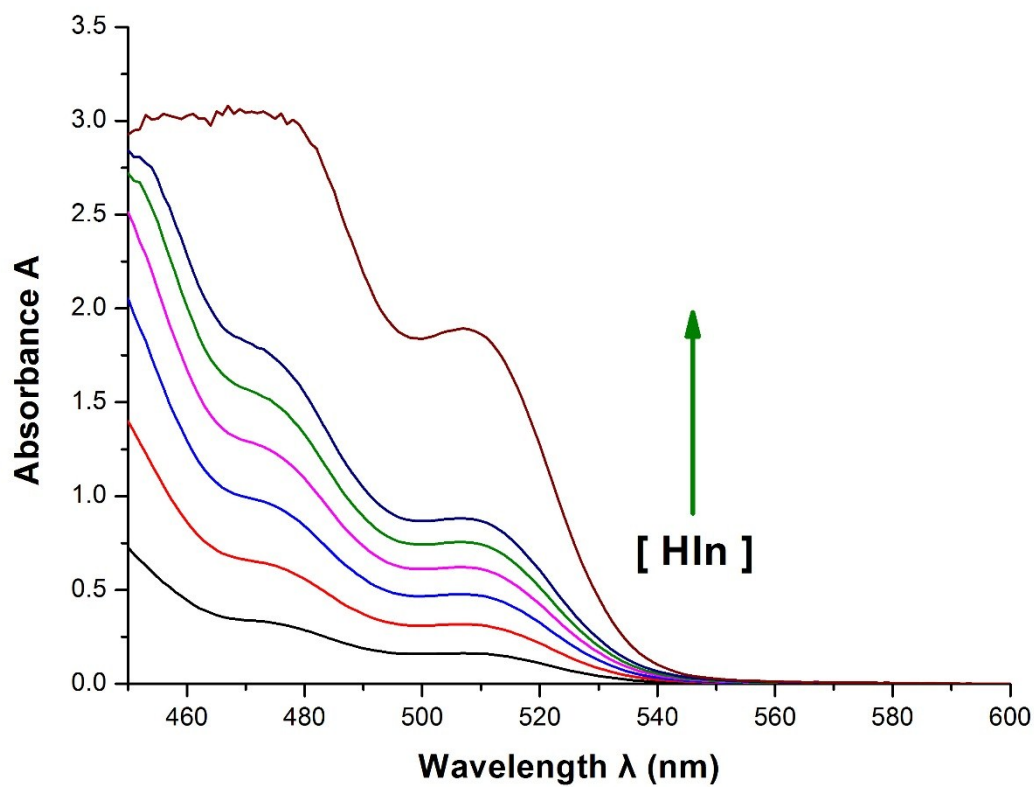


(a)

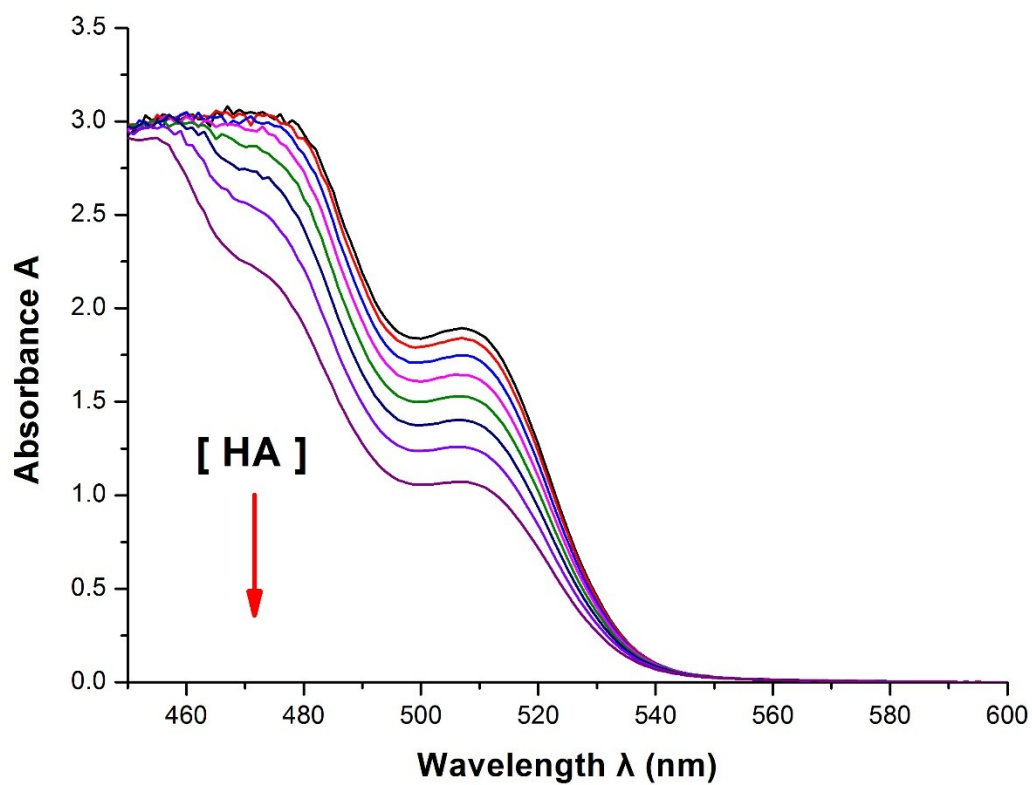


(b)

**Figure 11.** (a) Absorption spectra of the anion derived from **2,7-diBr-9-PhS-FH** for various added amounts of **2,7-diBr-9-PhS-FH** during the titration. (b) Absorption spectra of the anion derived from **2,7-diBr-9-PhS-FH** for various added amounts of catalyst **14** during the titration.

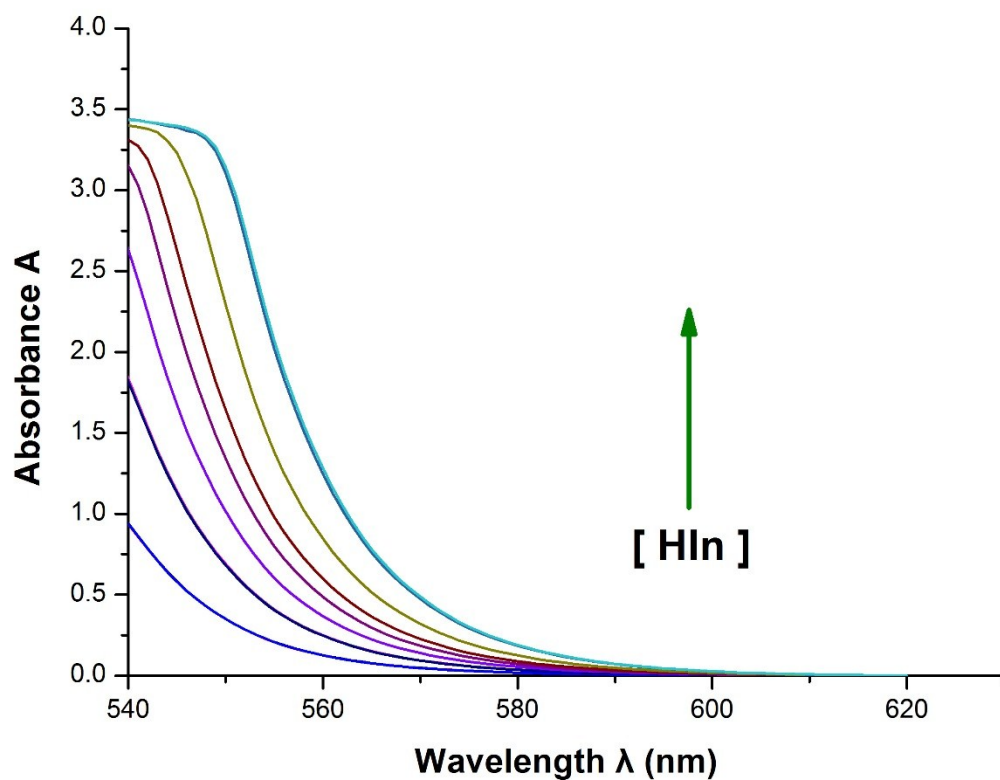


(a)

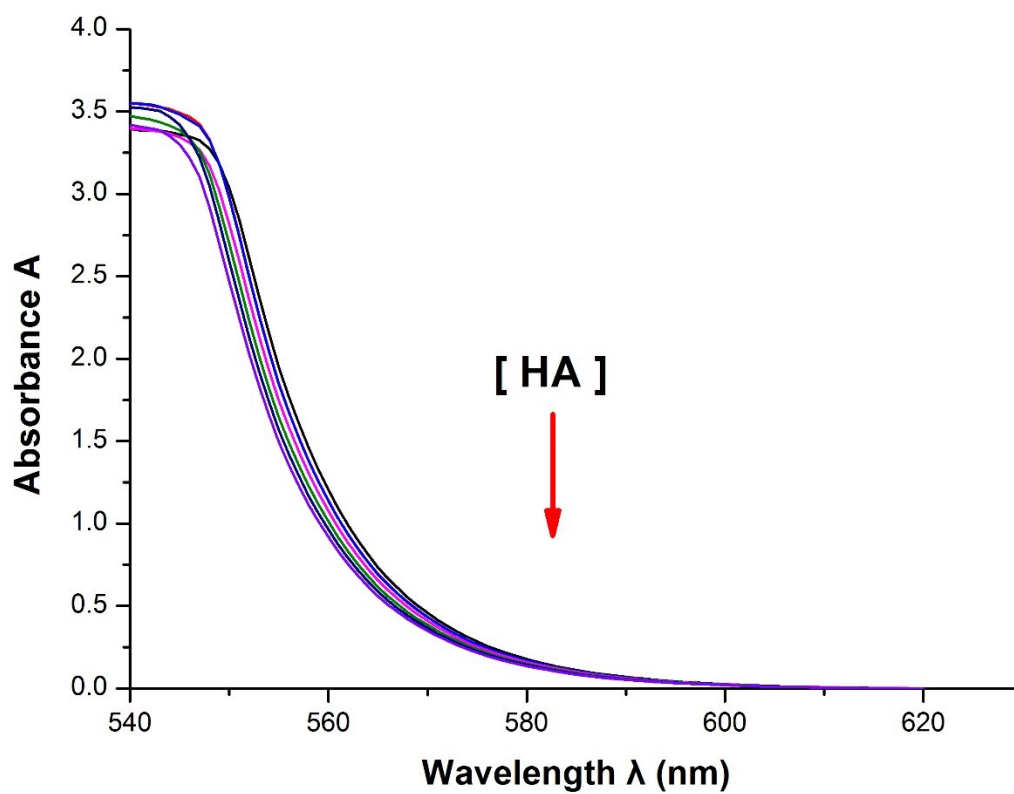


(b)

**Figure 12.** (a) Absorption spectra of the anion derived from 9-(3-Cl-Ph)-FH for various added amounts of 9-(3-Cl-Ph)-FH during the titration. (b) Absorption spectra of the anion derived from 9-(3-Cl-Ph)-FH for various added amounts of catalyst **15** during the titration.



(a)



(b)<sub>i</sub>

**Figure 13.** (a) Absorption spectra of the anion derived from 9-(2-Cl-Ph)-NHN-FH for various added amounts of 9-(2-Cl-Ph)-NHN-FH during the titration. (b) Absorption spectra of the anion derived from 9-(2-Cl-Ph)-NHN-FH for various added amounts of catalyst **1** during the titration.