The as-prepared metalloporphyrin Zn-TMPP was characterized with FTIR, UV-visible spectra and elemental analysis techniques. To compare the difference with the metal-free porphyrin, the FTIR and UV-visible spectra of TMPP were also measured.

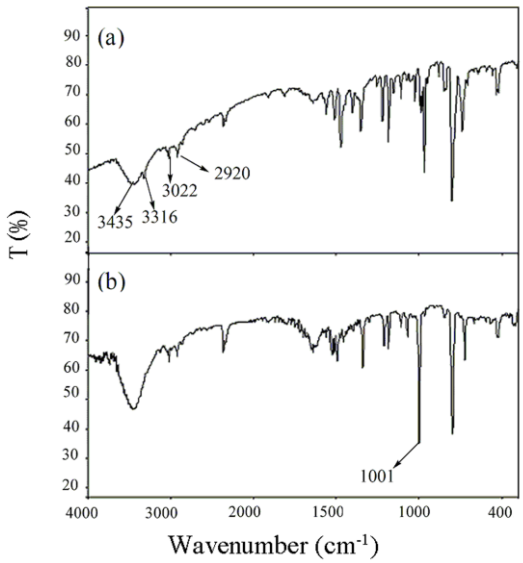

Fig. 1 FTIR spectra of TMPP (a) and Zn-TMPP (b).

Fig.1 gives the FTIR spectra of TMPP and Zn-TMPP chromophores. The absorption peaks in 1000-600 cm^{-1} region correspond to the skeletal vibration of the porphine rings, and 1600-1450 cm^{-1} region is related to the stretch of phene rings. The absorption peaks at 3022 and 2920 cm^{-1} originate from the stretch of $–CH_3$ and $–CH_2–$, respectively. The peak at 3435 cm^{-1} takes on the stretch of O-H, which means there is a small quantity of water in the sample. The obvious difference between Zn-TMPP and TMPP is that the formation of intense absorption peak at 1001 cm^{-1} in Fig. 1b, which is related to the absorption of N-Zn. Simultaneously, the peak at 3316 cm^{-1} belonging to the stretch of N-H (Fig. 1a.) is disappeared in Fig.1b.

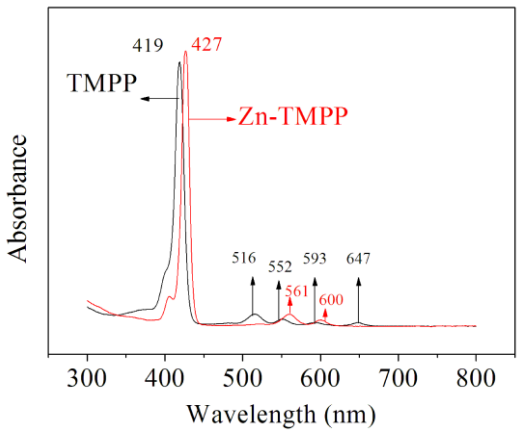

Fig. 2 UV-Vis absorption spectra of TMPP and Zn-TMPP.

In UV-visible absorption spectra (Fig. 2) of TMPP and Zn-TMPP dissolved with DMF as a solvent, the peak of *B* band at 427 nm for Zn-TMPP is red shifted as compared with that of TMPP at 419 nm, and the peaks of *Q* (450 -750 nm) bands also take on red shift from 552 and 593 nm to 561 and 600 nm, respectively. The obvious difference is that, due to the enhancement of symmetry, the number of the *Q* bands is decreased from 4 to 2. The *B* band is ascribed to the $S_0 \rightarrow S_2$ transition, and the *Q* bands correspond to $S_0 \rightarrow S_1$ transition.

The measured elemental analysis results of Zn-TMPP are as following. Found(%): C, 78.25; H, 5.07; N, 7.38. Calc. (%) for: C, 78.52; H, 4.94; N, 7.63. The reason for measured value of H higher than the calculated value is that there is a small amount of water in the sample, which can be verified from FTIR spectrum in Fig.1.

The above FTIR, UV-visible spectra and elemental analysis all demonstrate that Zn -TMPP chromophore was synthesized.