Supplementary file 1: The as-prepared Alq3 was characterized with XRD, MS, FTIR and UV-Vis absorption spectra means.

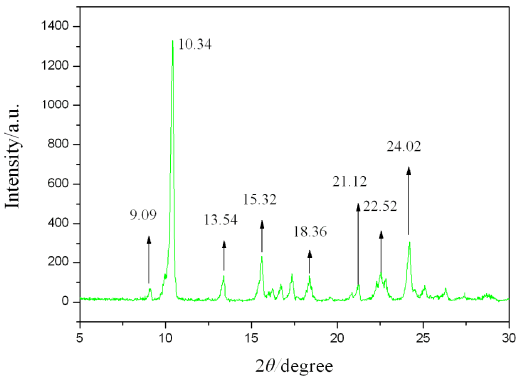

Fig. 1 XRD patterns of Alq3.

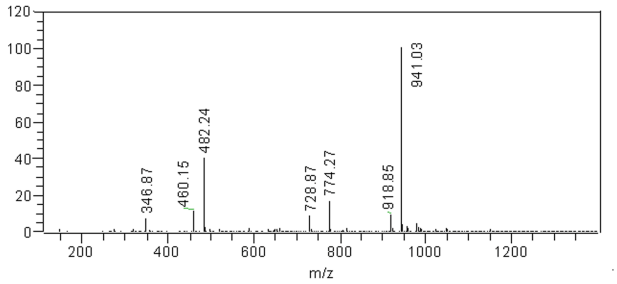

Fig.2 The mass spectrum of Alq3.

The X-ray diffraction pattern of the as-prepared Alq3 was shown in Fig.1. All clear diffraction peaks can be assigned to the cubic Alq3, which are consistent with the standard reported values (JCPDS 26-1550). No characteristic peak from impurity is detected, indicating that the products are pure Alq3. This is in good agreement with the result observed from the FTIR curve.

The mass spectrum of Alq3 was depicted in Fig.2. From the MS spectrum the ratio of charge/ mass of Alq3 has been achieved. A peak of $Alq3^+$ located at m/e = 460.15 was observed. It was a molion peak of Alq3, corresponding to the ionization ($Alq3^+$) of Alq3. The peaks located at m/e = 482.24, 918.85 and 941.03 were the peaks of $M + Na^+$, $2M + H^+$,and $2M + Na^+$, respectively.

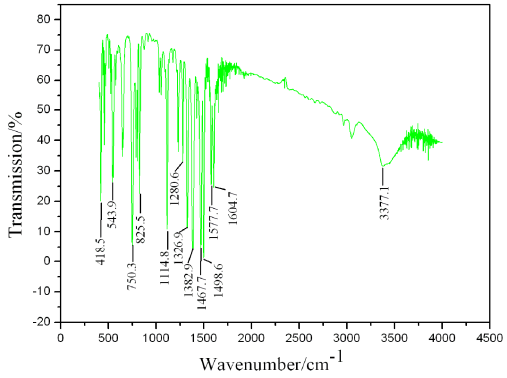

Fig.3 FT-IR absorption spectrum of Alq3.

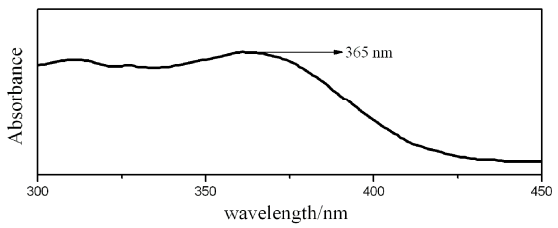

Fig.4 UV-vis absorption spectrum of Alq3 aqueous solution (25μM).

The composition of Alq3 has been investigated by FTIR measurement. As shown in Fig. 3, the FTIR absorption spectrum of Alq3 displays all the characteristic absorbance of quinoline and the Al ion with ligands. For example, the characteristic bands centered at 600-800 cm^{-1} come from the vibrations of quinoline, and the band at 400-600 cm^{-1} can be attriubuted to the stretching vibration of Al ion with ligands. Compared with the normal FTIR absorption spectrum of quinoline, the intensive band of C-O at 1114.8 cm^{-1} and the weaken band at 1280.6 cm^{-1} indicated that the Al-O bond had formed.

Fig. 4 shows the absorption spectra of Alq3 in aqueous solution. It exhibits a wide absorption band from 330 nm to 400 nm with a peak at about 365 nm, which is attributed to the charge transfer transition from N to O.

Supplementary file 2:

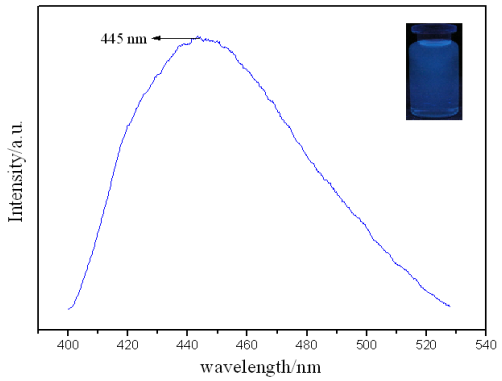

Fig.5 Emission spectrum of Alq3/BA aqueous solution
(Inset: Emission from samples illuminated with a UV lamp, λ_{ex} = 365

As shown in Fig. 5, the emission peak of Alq3 in BA aqueous solution is 445 nm, and the blue light can be clearly observed (see the upper-right of Fig.5).