
Facile Solution Synthesis of Hexagonal Alq₃ Nanorods and Their Field Emission Properties

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Experimental Section

The compounds of tris(8-hydroxyquinoline)aluminum (Alq₃) and cetyltrimethylammonium bromide (CTAB) used in this study were purchased from Aldrich Chemical Co.. Other agents (A. R.) were purchased from Beijing Chemical Reagent Corp., China. Ultrapure water with a resistivity of 18.2 MΩ cm was produced using a Milli-Q apparatus (Millipore) and was filtered using an inorganic membrane with a pore size of 0.02 μm (Whatman International, Ltd.) just before use.

Alq₃ nanorods were prepared by a facile solution phase route. A stock solution contained 2.5 mmol/L tris(8-hydroxyquinoline)aluminum in trichlormethane/ethanol (CHCl₃/C₂H₅OH) (1:1, in volume) was firstly prepared. Then, 100 μL of stock Alq₃ solution was quickly injected into 5 mL of aqueous solution of 0.45 mmol/L cetyltrimethylammonium bromide (CTAB) while violently stirring at room temperature (25 °C). The mixture was continuously stirred for another 2 h. After the growth was completed, the resulting yellowish green suspension was centrifuged at 6,000 rpm. The solid product was collected and washed several times by ultrapure water (Millipore) to remove the remained surfactant, and then dispersed again in

ultrapure water for characterization of scanning electron microscopy (SEM) and transmission electron microscopy (TEM). SEM images were obtained from a Hitachi S-4300F scanning electron microscope equipped with energy dispersive X-ray analyzer (Phoenix). A JEM JEOL 2010 working at 200 kV was used to collect TEM images.

FTIR spectrum was obtained with KBr pellets on Bruker Tensor 27 FT-IR spectrometer. Raman scattering spectrum was recorded on a Bruker RFS 100 Raman spectrometer with a laser of 1064.4 nm at a power density of $50 \text{ mW} \cdot \text{mm}^{-2}$. A Rigaku D/max-2500 using filtered Cu $K\alpha$ radiation was used to carry out X-ray diffraction measurement.

The field emission measurements were carried out in a vacuum chamber of $5 \times 10^{-7} \text{ Pa}$ at room temperature under a two-parallel-plate configuration. The silicon slice with Alq_3 nanorods was stuck onto a stainless-steel sample stage using conducting glue as the cathode. Another parallel stainless-steel plate served as the anode. The samples' areas were about 0.5 cm^2 . The distance between the anode and cathode is $350 \text{ }\mu\text{m}$. A voltage with a sweep step of 50 V was applied between the anode and cathode to supply an electric field.

Energy dispersed X-ray (EDX) analysis

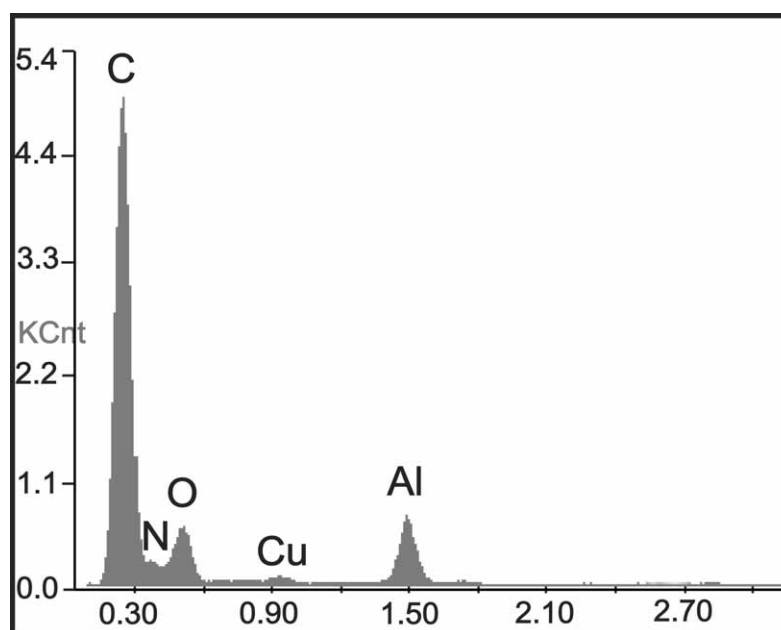


Figure S1. Energy dispersed X-ray (EDX) analysis of the Alq₃ nanorods