

Color Control of Quantum Dot by Grafting Organic Fluorescent Molecules

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Quantum dot white light emitting diodes are attractive because of color rendition capability afforded by efficient and narrow-band emission that is possible with light-emitting quantum dots, coupled with planar lighting capability instead of point lighting. Here, we present an approach of utilizing a single compound quantum dot for realizing white-light emission. We demonstrate the concept by creating a grafted quantum dot in which a yellow-emitting quantum dot of CdSe/ZnS is grafted with a blue-emitting fluorescent molecule of anthracene derivative. We found that the desired temperature of white color, from warm to cold, can readily be attained by adjusting the weight ratio of quantum dot to grafted molecule and size control of quantum dot. Our results demonstrate the advantages of simple device fabrication with associated reduction in costs and simple way of adjusting color temperature, which are made possible by the approach of single type of quantum dot that emits white light.