Fabrication of Quantum dots free-standing composite film with Parylene-C

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Quantum dots(QDs) is a 'key' materials in display and photosensor fields in that can release a narrow radiation band. So it could be a possible that we can indicate clear and bright colors from QDs. But even now, the issues including its thermal & chemical stability against circumstances are still remained and many related researches are still in progress. In our system, we introduced a Parylene-C film, synthesized from [2.2]paracyclophane, as passivation layer. There are a few reasons that the Parylene-C was used in composite film. Parylene is known as polymer in electric materials for protecting substances which are sensitive to oxygen or air. As, furthermore, Parylene thin film is synthesized at mild temperature and low pressure, CVD system conditions does not affect QDs performance and so synthesized Parylene-C layer protects the QDs nanoparticle from moderate environments. To further increase the utilization of the film, we tried to take a free-standing film by coating a sacrificial layer on substrates first. This free-standing film obtained without any physical stimulation has versatile applications using its thin thickness and flexibility properties.