

Efficient Layered Electroluminescence Devices Prepared by the Spin Self-Assembly Method

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In this study, we prepared two kinds of PPV (poly(p-phenylene vinylene)) based EL devices via three different methods and evaluated the film properties as well as device performance (i.e., in terms of relative quantum efficiency). For this investigation, samples were fabricated as follows: spin casted PPV single layer, and PPV/PMA multilayer using a spin SA method.

Herein, we report that the respective layer thickness of spin SA multilayer thin films can be exactly controlled with relatively low degree of interpenetration between adjacent layers. Furthermore, based on these improved film quality, Confined structure consisting of semiconducting PPV and insulating PMA layers can be obtained from spin SA method. In the case of confined multilayered structure, relative quantum efficiency increases with the increased recombination rate of electrons and holes due to screening the leakage of excess holes. Therefore, nanolaminated EL multilayer devices fabricated by spin SA method show higher quantum efficiency than other methods.