

Chapter 5: Conclusion

In this thesis, we studied the dependence of fluorescence intermittency of single CdSe/ZnS QD on the excitation power, insulating and conducting surrounding, QD size, and various organic ligand conjugations on CdSe and ZnS surface. All the samples were synthesized by chemical colloidal method. The single QD fluorescence measurement is performed by the time-tag-time-resolved system. The fluorescence blinking frequency was found to increase with the increasing excitation power. On the other hand, the on-time interval and lifetime are reduced with the increasing excitation intensity. We also found that the off-time is independent of the excitation intensity. If the QD surrounding was changed from glass coverslip substitute to gold nanoparticle coated substrate, the intensity of QD will be enhanced, and the blinking frequency will reduce. In addition, we found that the fluorescence intermittency behavior is independent on QD size. Moreover, core/shell CdSe/ZnS QD has higher on-time interval and on-time ratio than CdSe QD. We further observed that the TOPO-HDA-PA capped CdSe and CdSe/ZnS has the best passivation and also highest quantum efficiency.