P-122

고품위 InAs/GaAs 양자점을 위한 성장 기법 연구

Growth of high quality InAs quantum dots on GaAs substrates

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We investigated the morphology of self-assembled InAs quantum dots(QDs) grown by molecular beam epitaxy(MBE) on GaAs(001) substrate using atomic force microscopy(AFM) while varying the growth conditions. It is shown that the size and uniformity of these QDs can be controlled by the precise adjustment of growth temperature and growth rate and also by interruption time(30sec). With increasing the growth temperature, the QDs density becomes lower and the size larger. With increasing the growth rate, the QDs density becomes higher and the size smaller. And the low arsenic pressure provided the long migration length of indium adatoms and resulted in the narrow size distribution of InAs QDs. Also, the dot size uniformity is improves by using interruption time(30sec) with low growth rate, but isn't with high growth rate.