

Fig. 5.1 The DCX data of Sample A, the flow rate of TMI_n was 54 sccm.

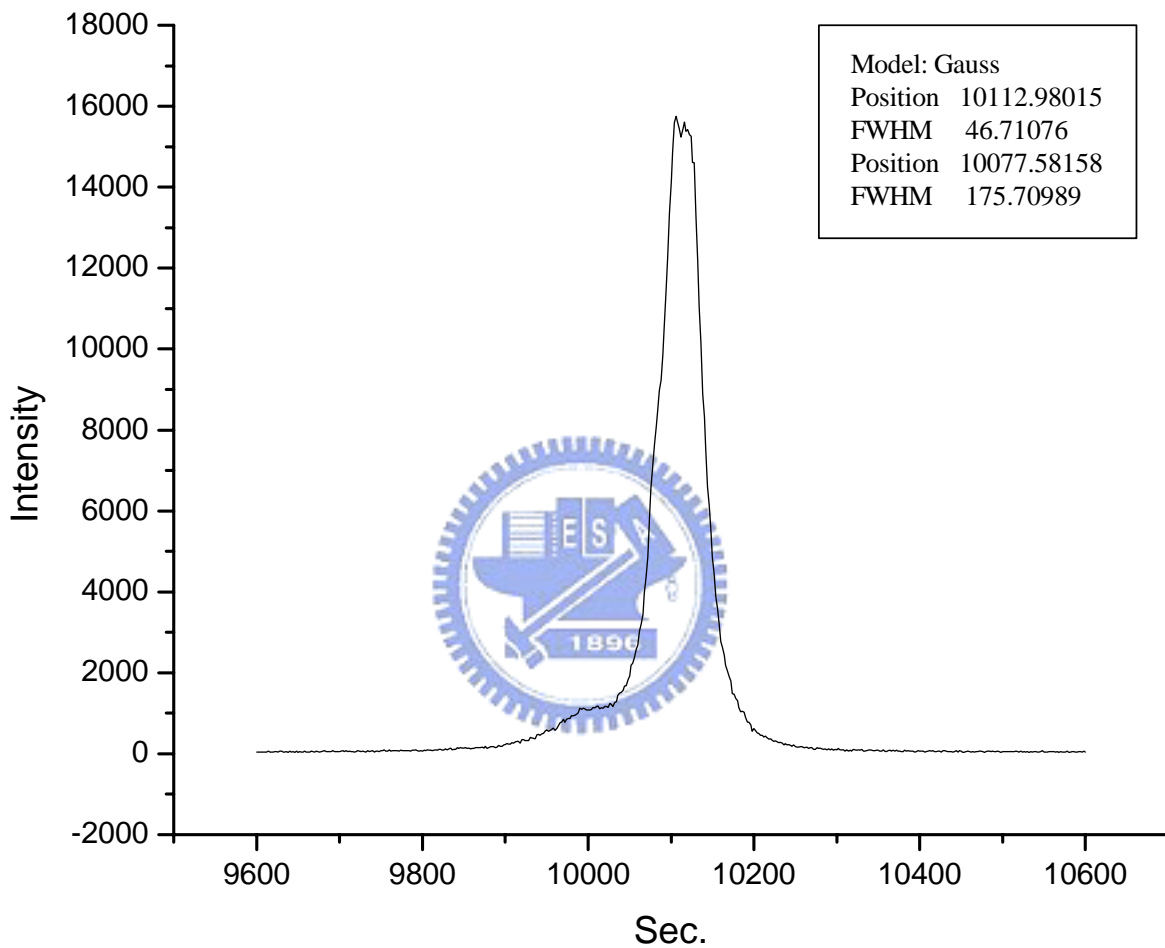


Fig. 5.2 The DCX data of Sample B, the flow rate of TMI_n was 51 sccm.

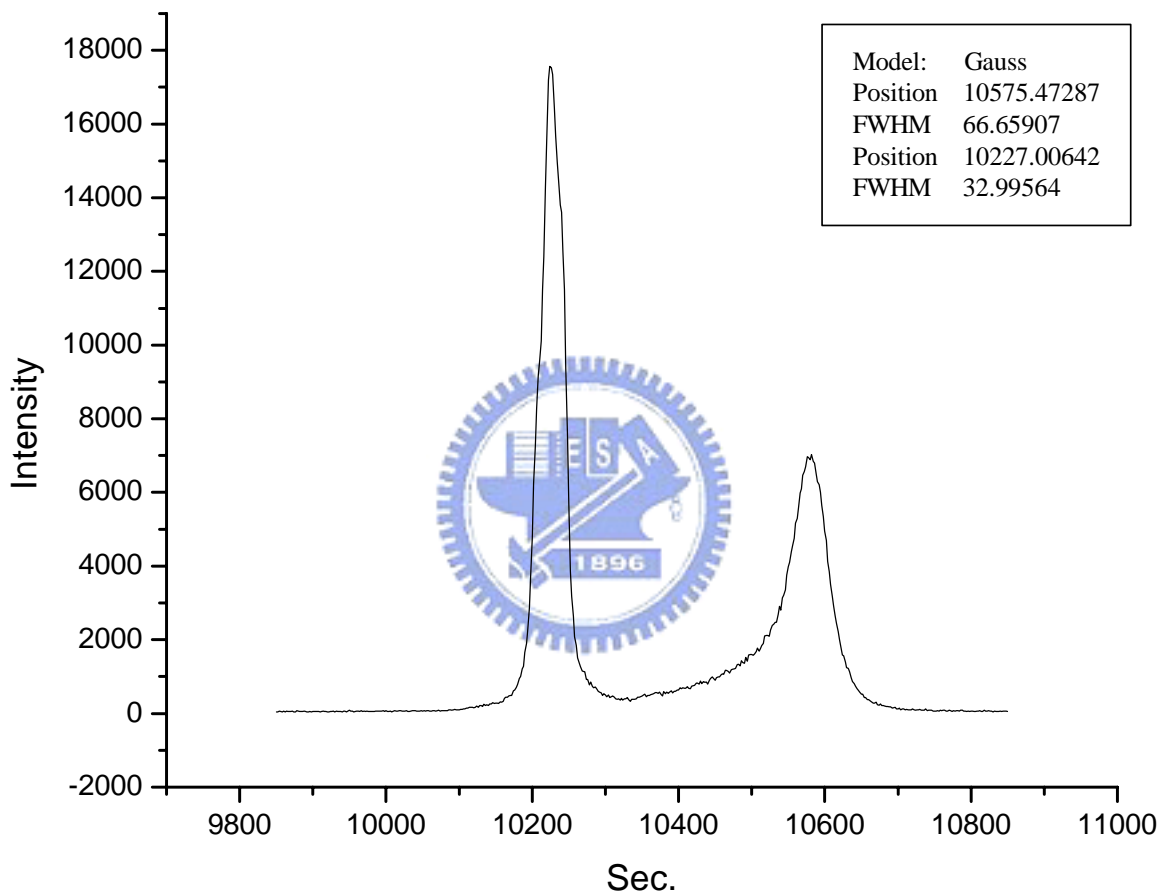


Fig. 5.3 The DCX data of Sample C, the flow rate of TMI_n was 51 sccm but the T_g of InGaP was 700C.

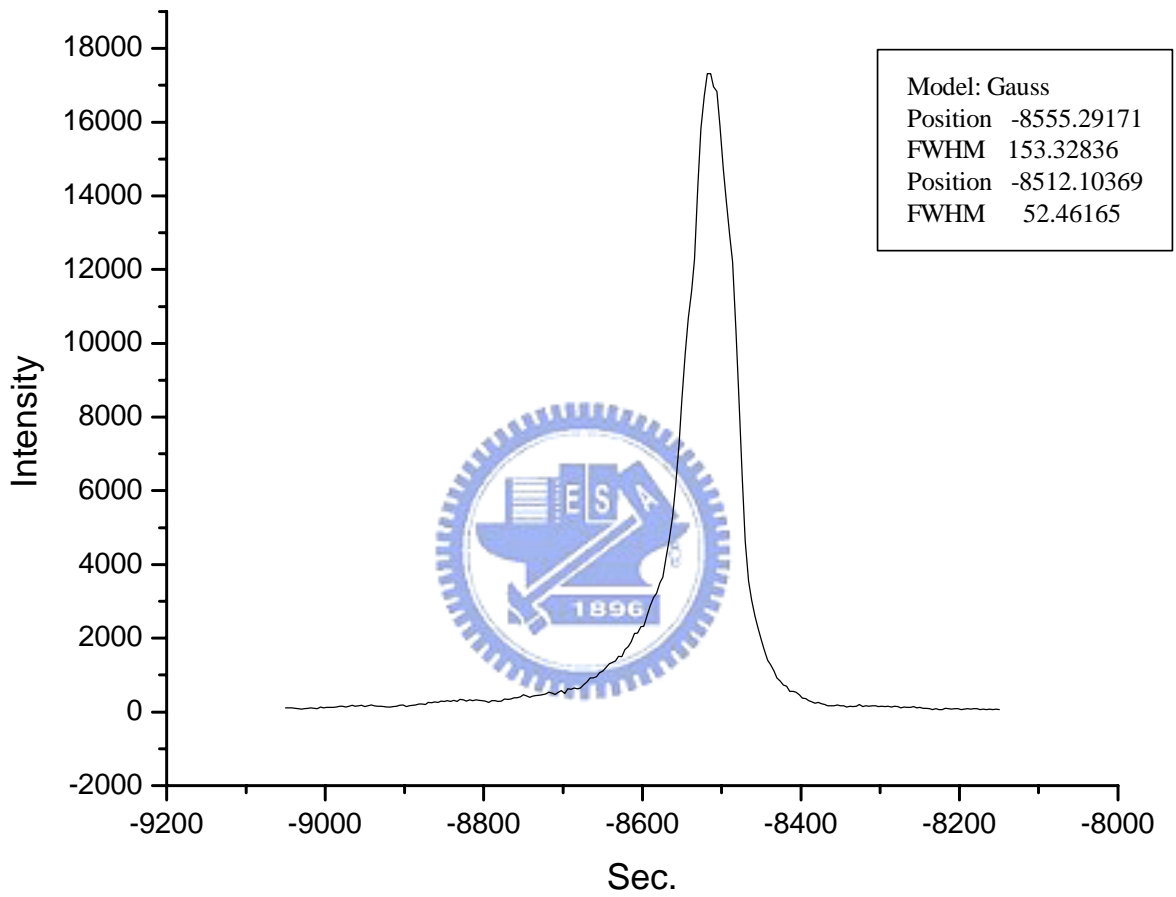


Fig. 5.4 The DCX of the lattice-matched InGaP layer, the flow rate of TMI_n was 49.7 sccm.

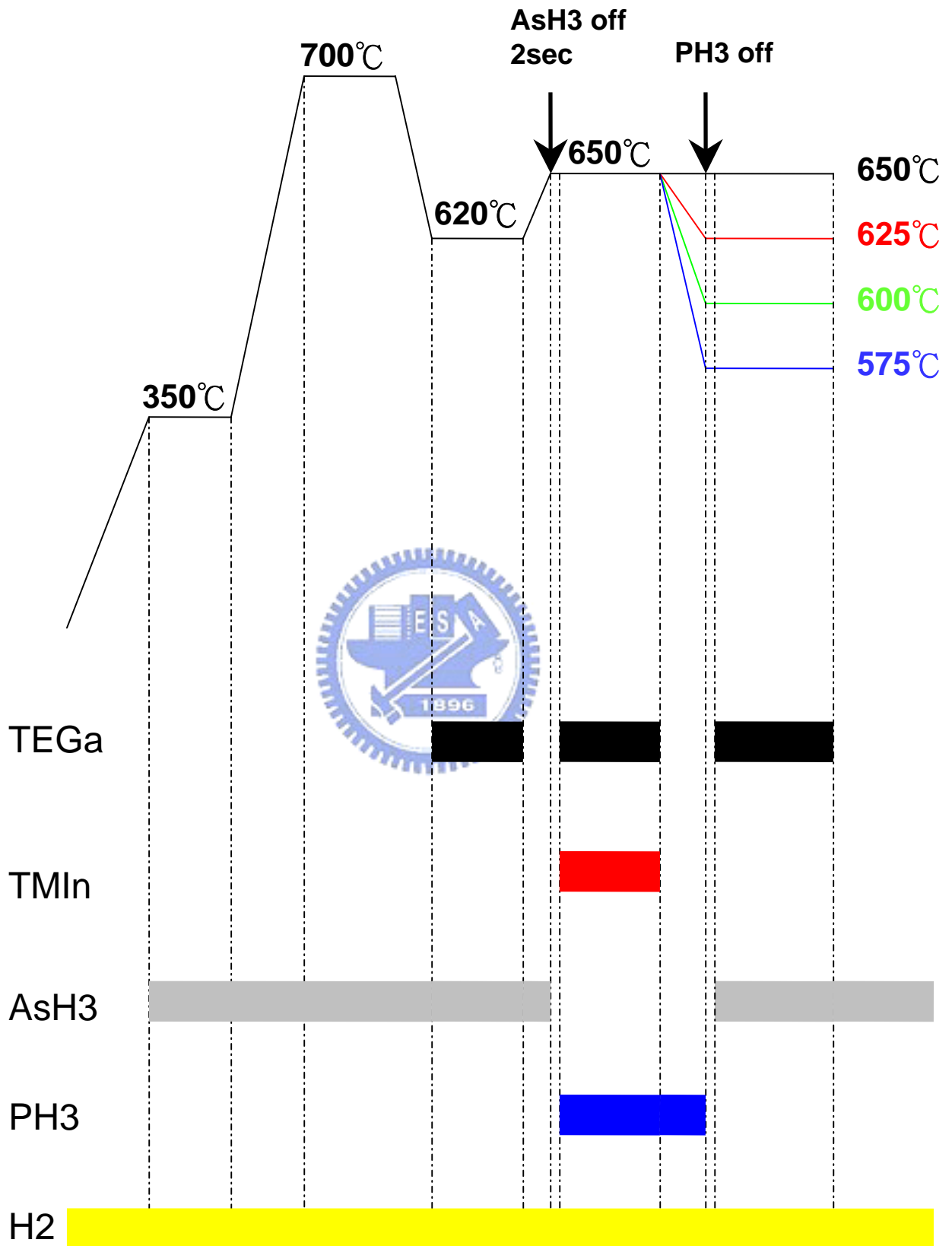


Fig 5.5 Schematic diagram of the GaAs/InGaP/GaAs growth process.

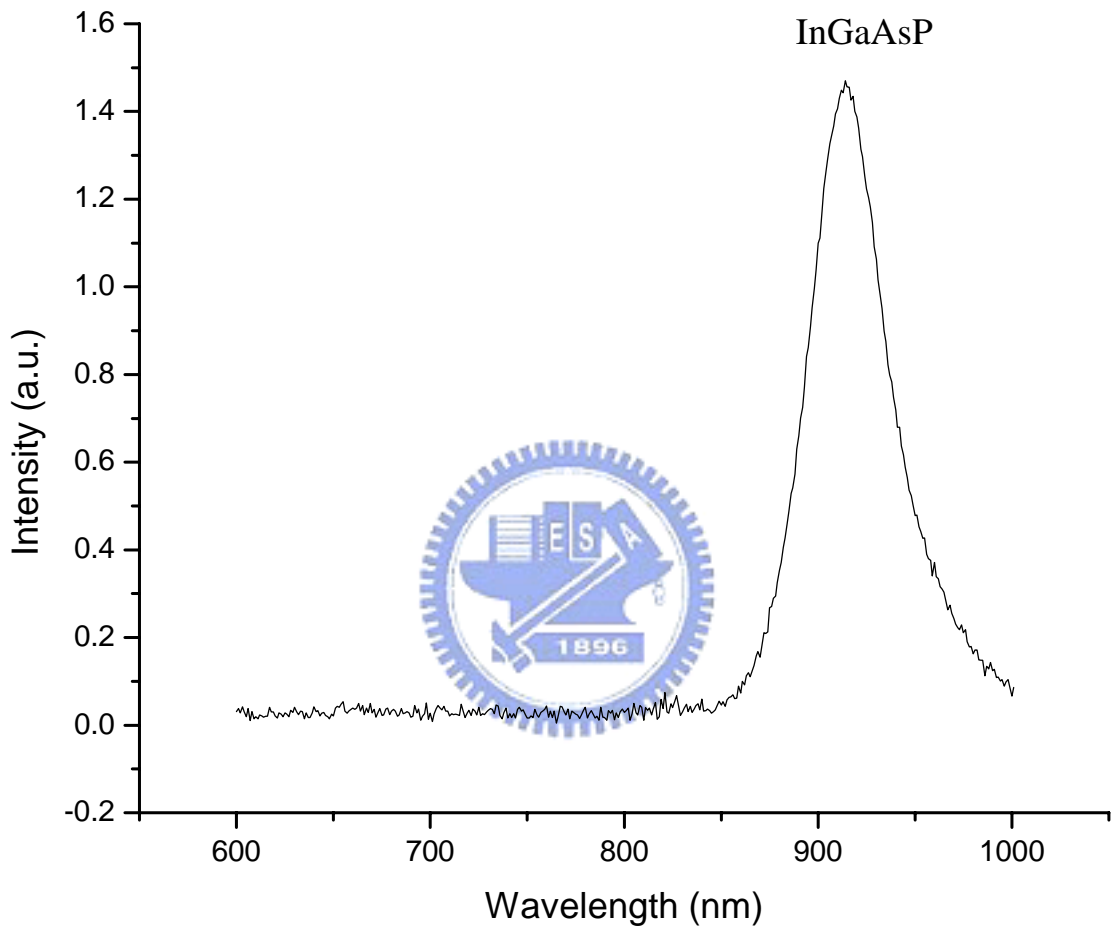


Fig. 5.6a The PL intensity verse wavelength of sample-650.

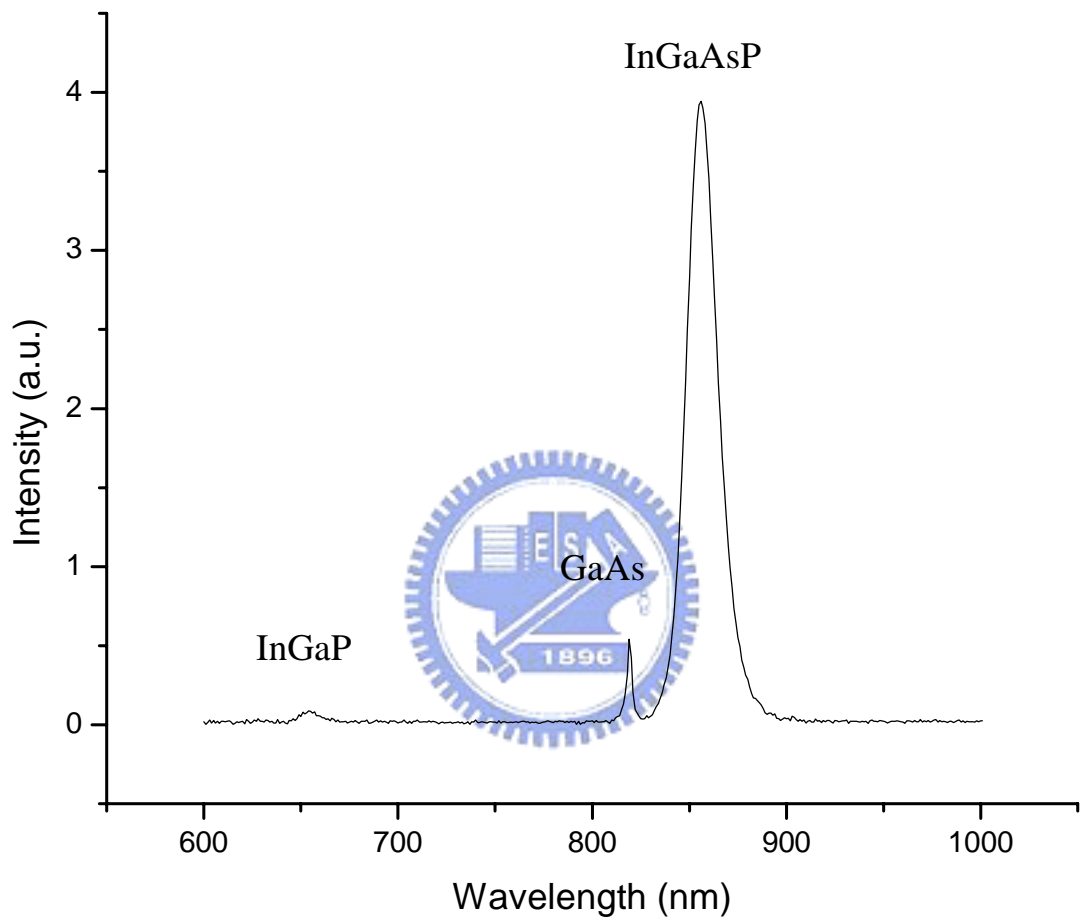


Fig. 5.6b The PL intensity verse wavelength of sample-625.

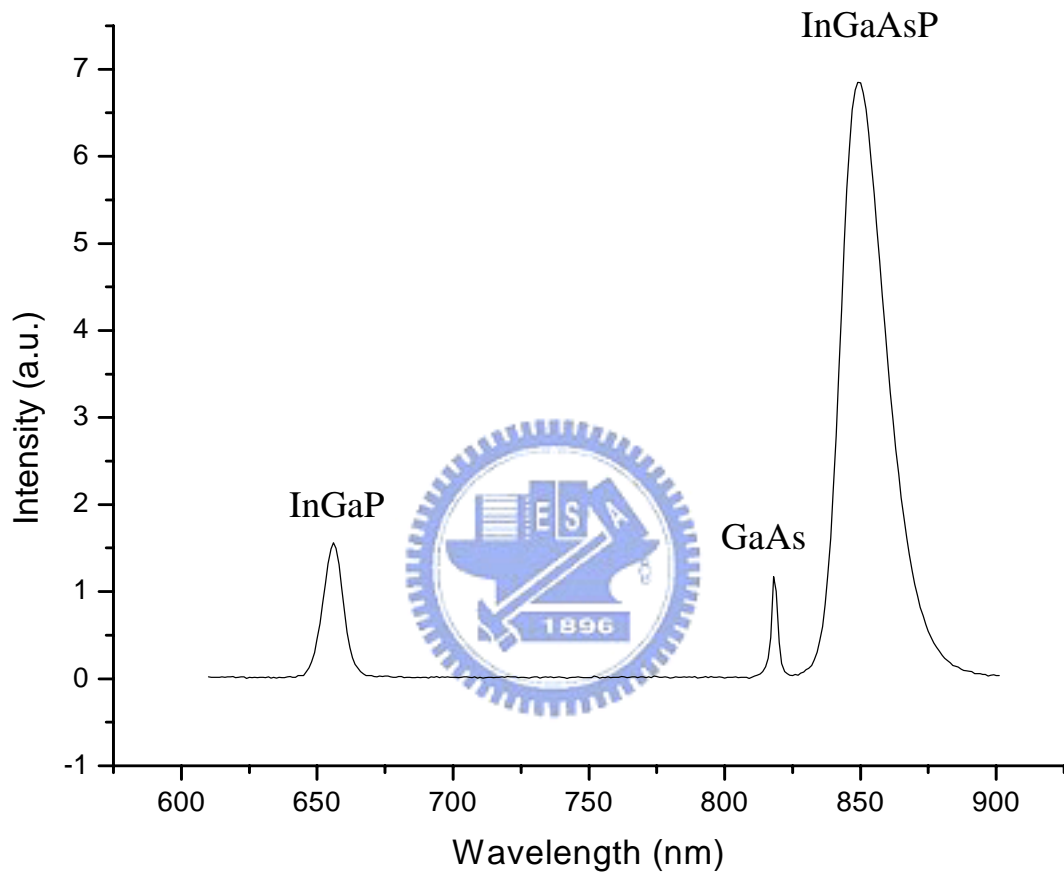


Fig. 5.6c The PL intensity verse wavelength of sample-600.

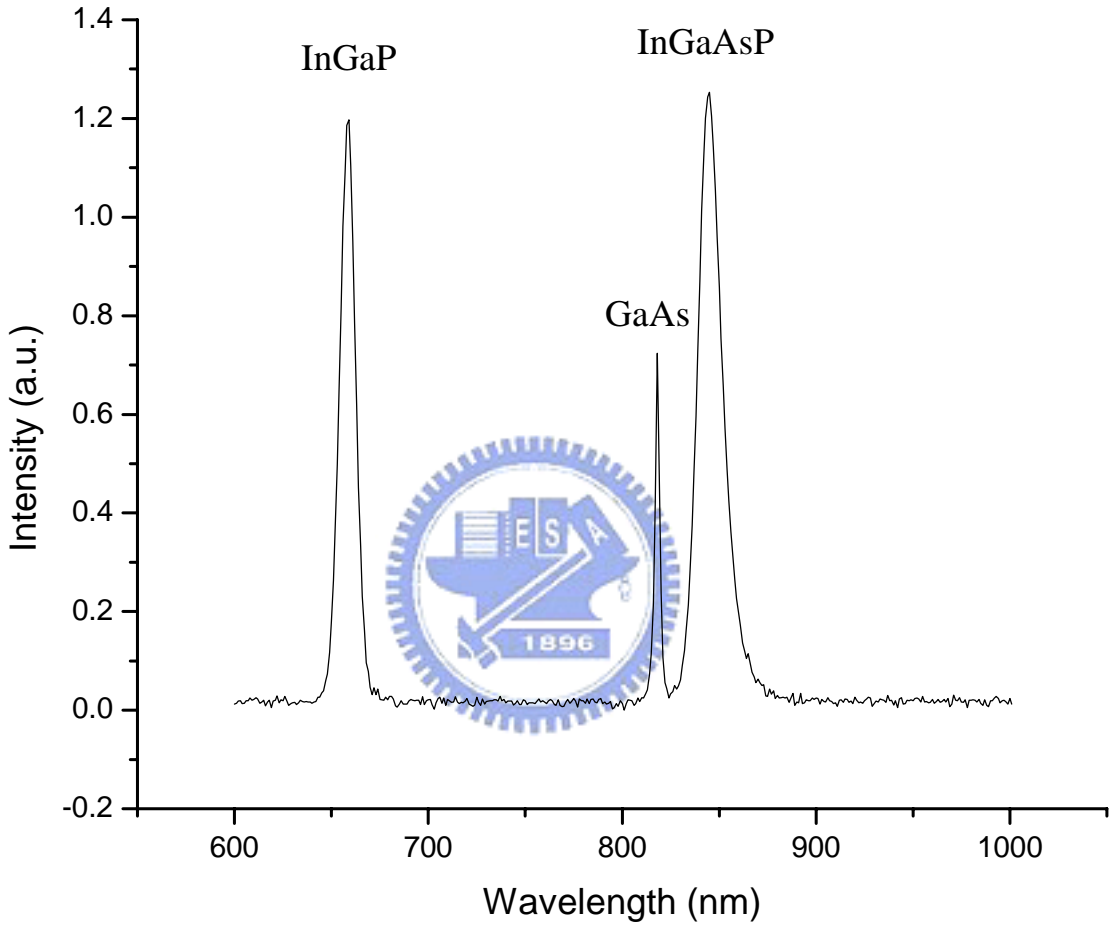


Fig. 5.6d The PL intensity verse wavelength of sample-575.

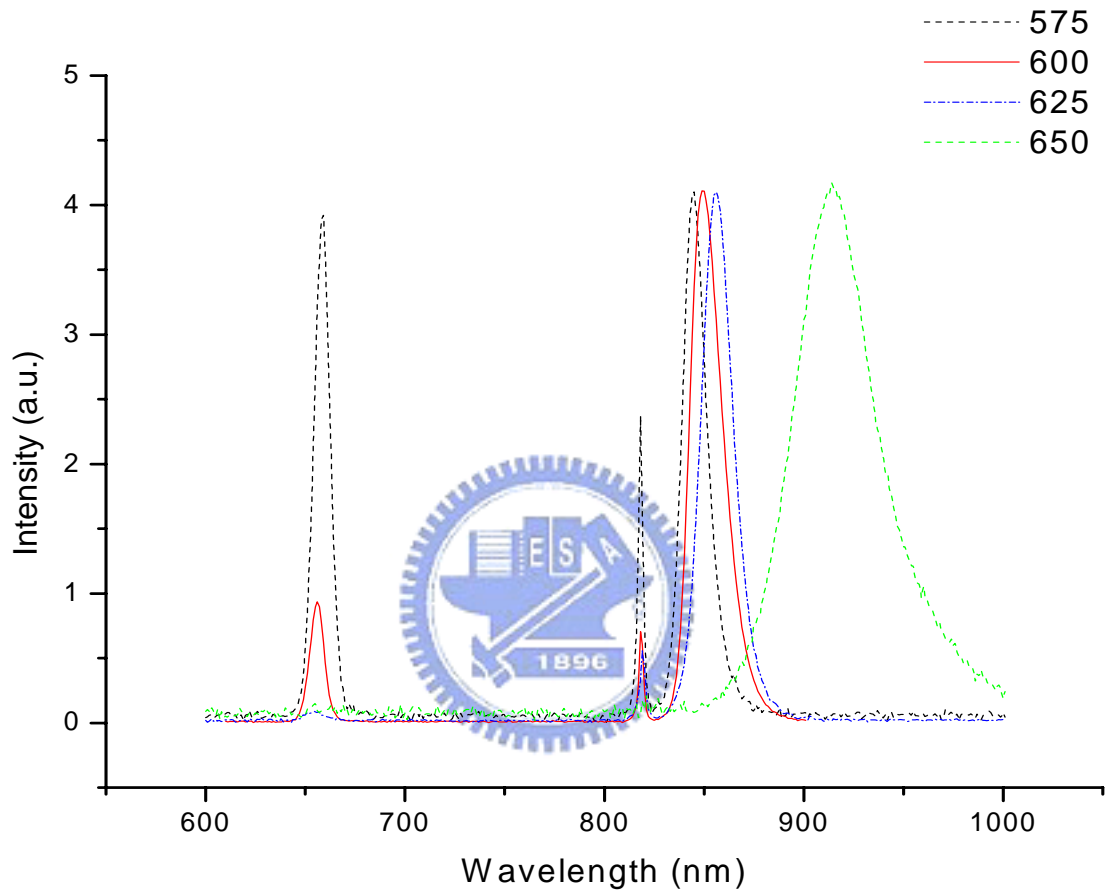


Fig. 5.6e The PL intensity verse wavelength of four samples with different GaAs cap growth temperatures.

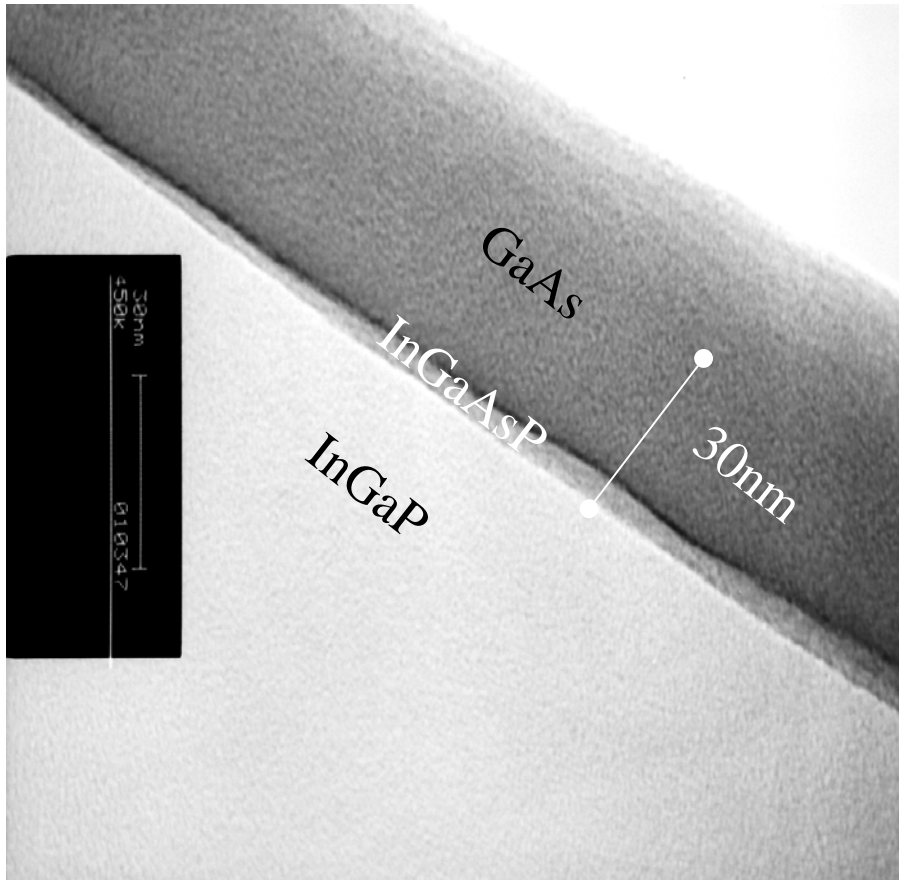


Fig 5.7 The TEM bright field image of sample-600.

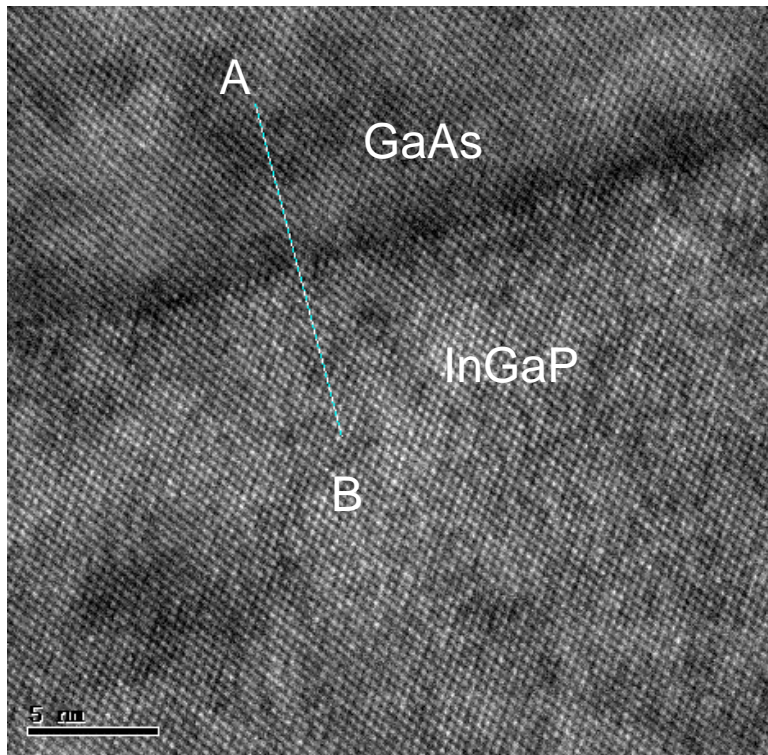


Fig. 5.8a The HRTEM of sample-625

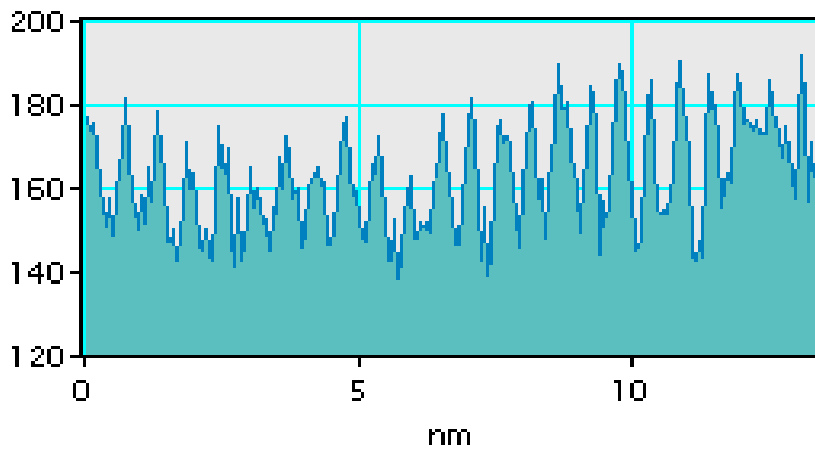


Fig.5.8b The depth profile from point A to B on Fig. 5.8a shows no obvious step across interface.

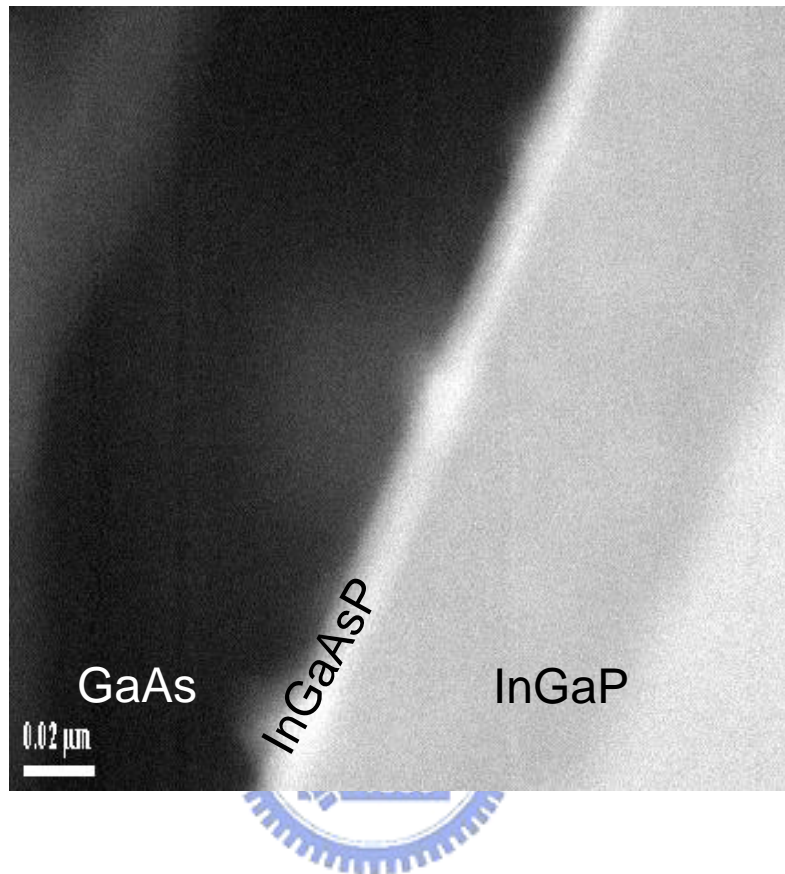
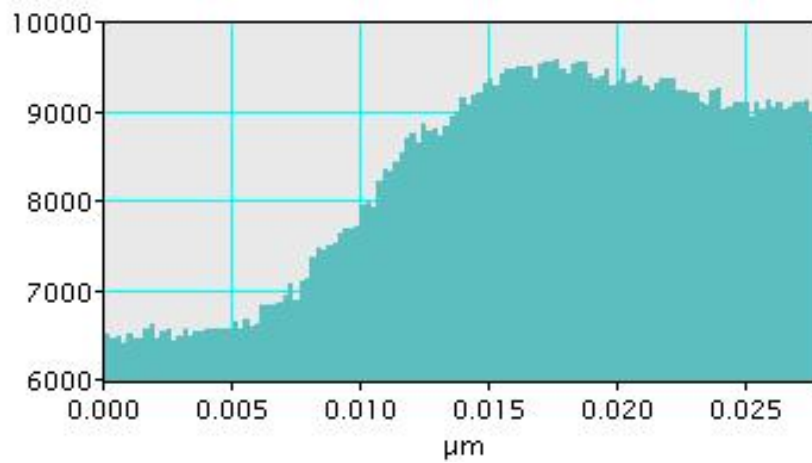


Fig. 5.9a The STEM image of sample-625



5.9b The composition profile across the interface of GaAs and InGaP

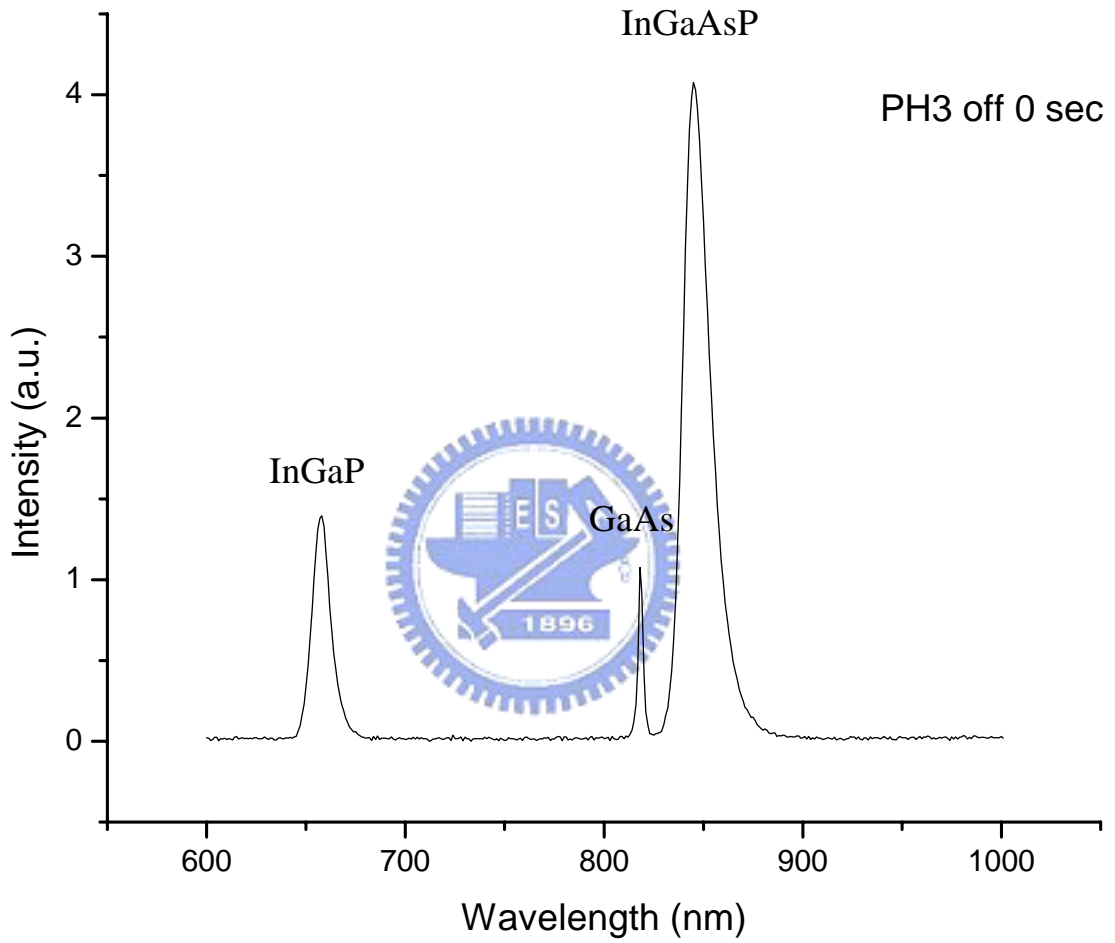


Fig. 5.10a The PL intensity versus wavelength of the sample with 0 sec PH₃ off time.

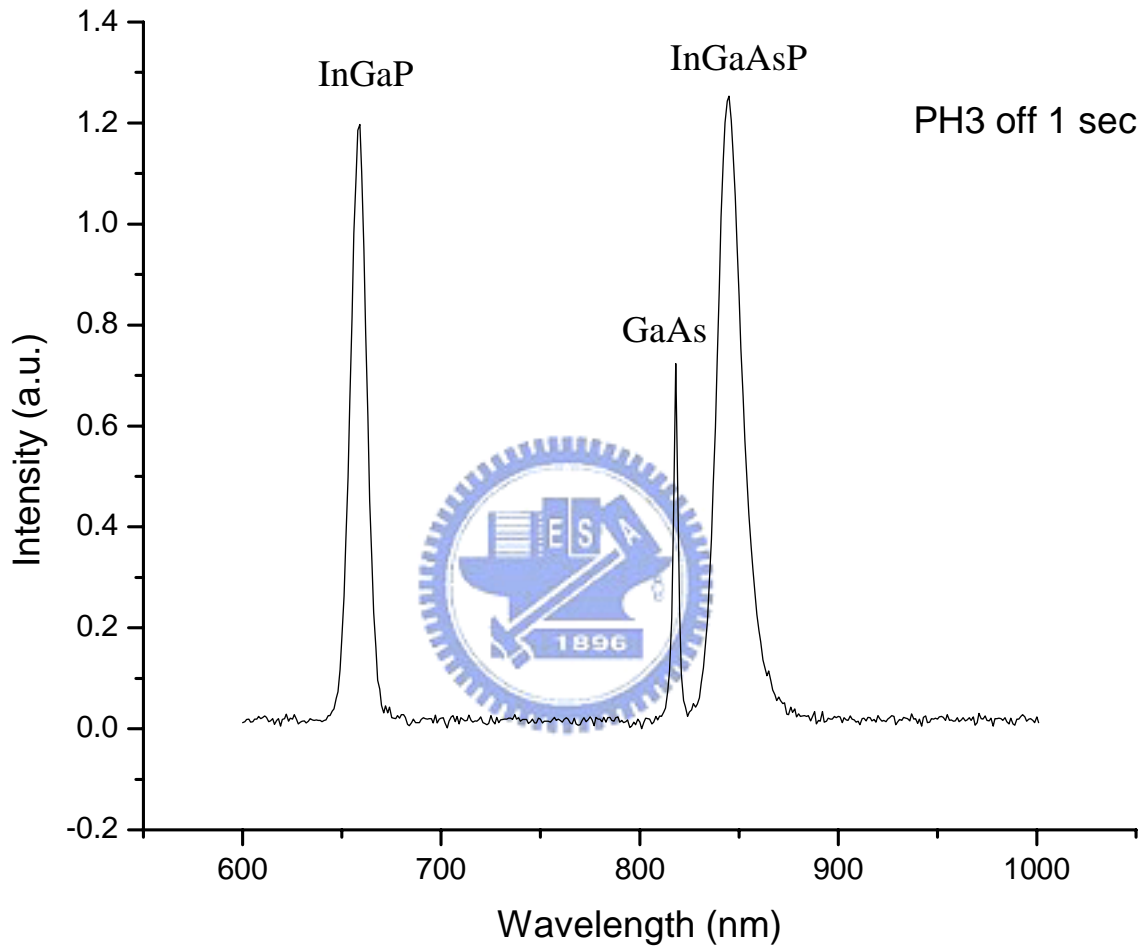


Fig. 5.10b The PL intensity verse wavelength of the sample with 1 sec PH₃ off time.

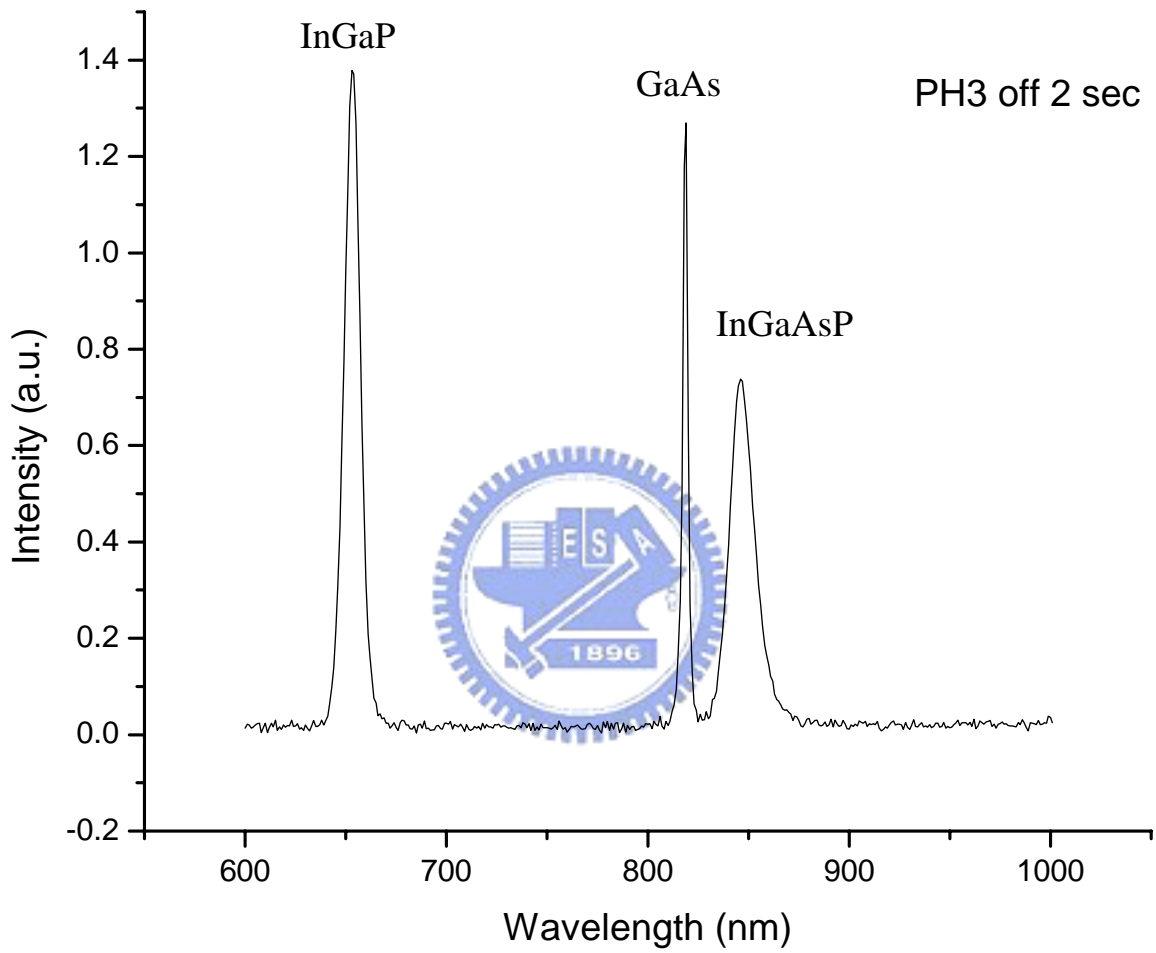


Fig. 5.10c The PL intensity verse wavelength of the sample with 2 sec PH₃ off time.

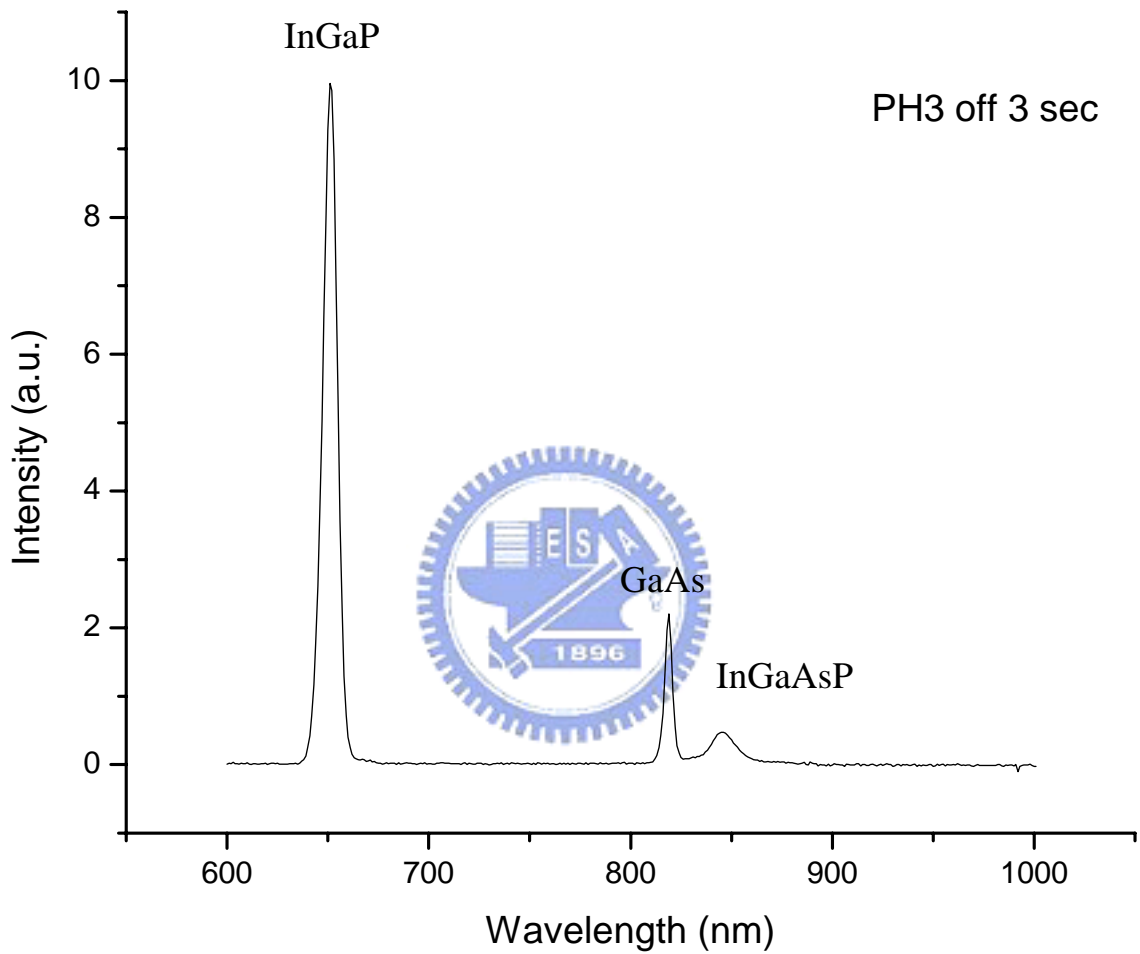


Fig. 5.10d The PL intensity versus wavelength of the sample with 3 sec PH₃ off time.

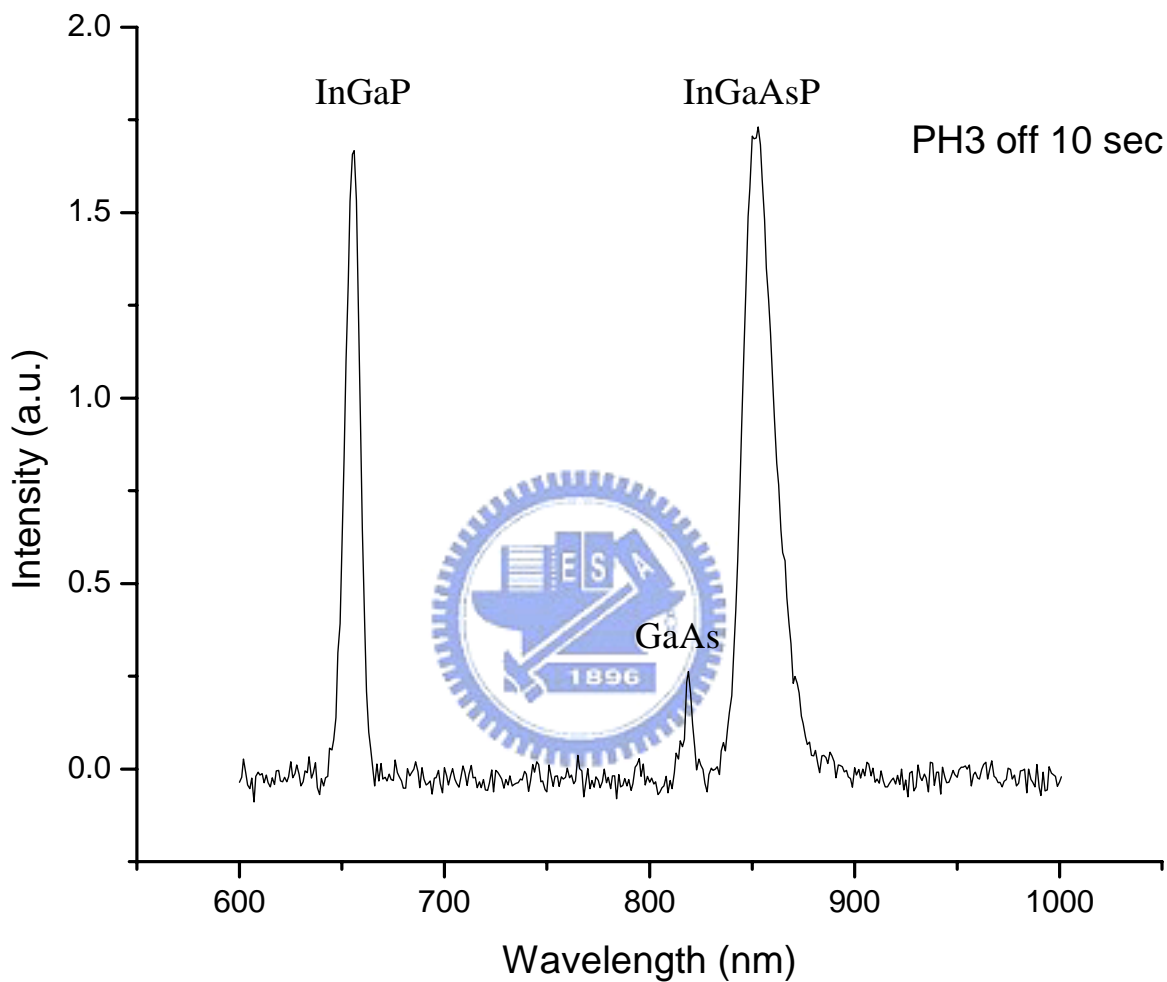


Fig. 5.10e The PL intensity versus wavelength of the sample with 10 sec PH₃ off time.

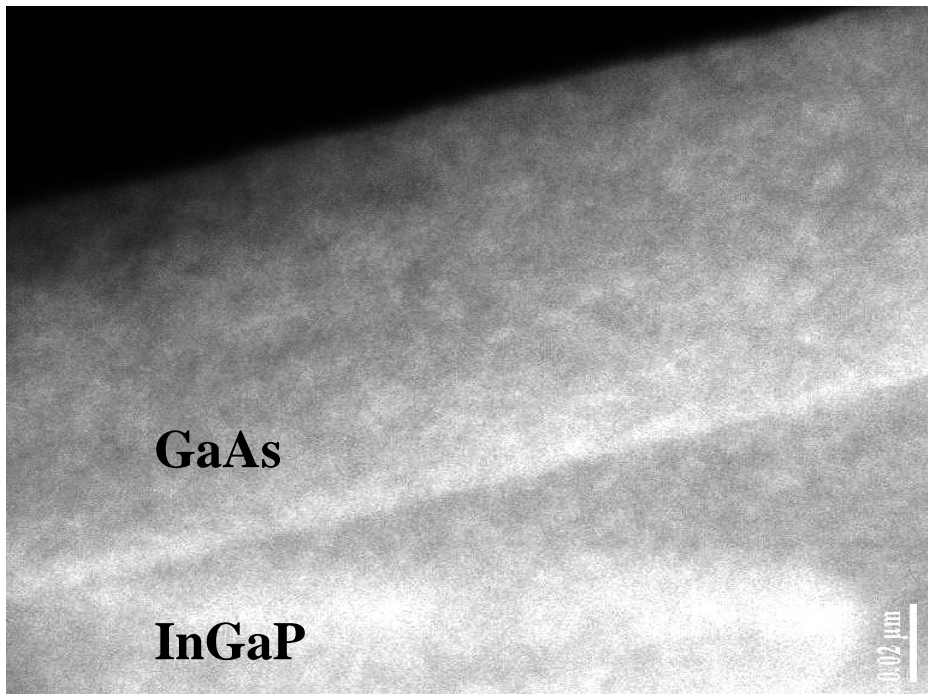


Fig. 5.11a The STEM image of sample with 0 sec PH₃ off

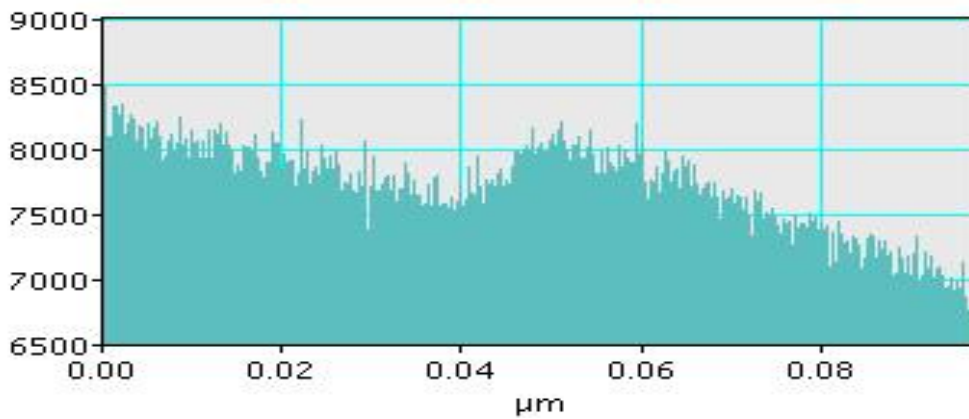


Fig. 5.11b The composition profile across the interface of GaAs and InGaP.

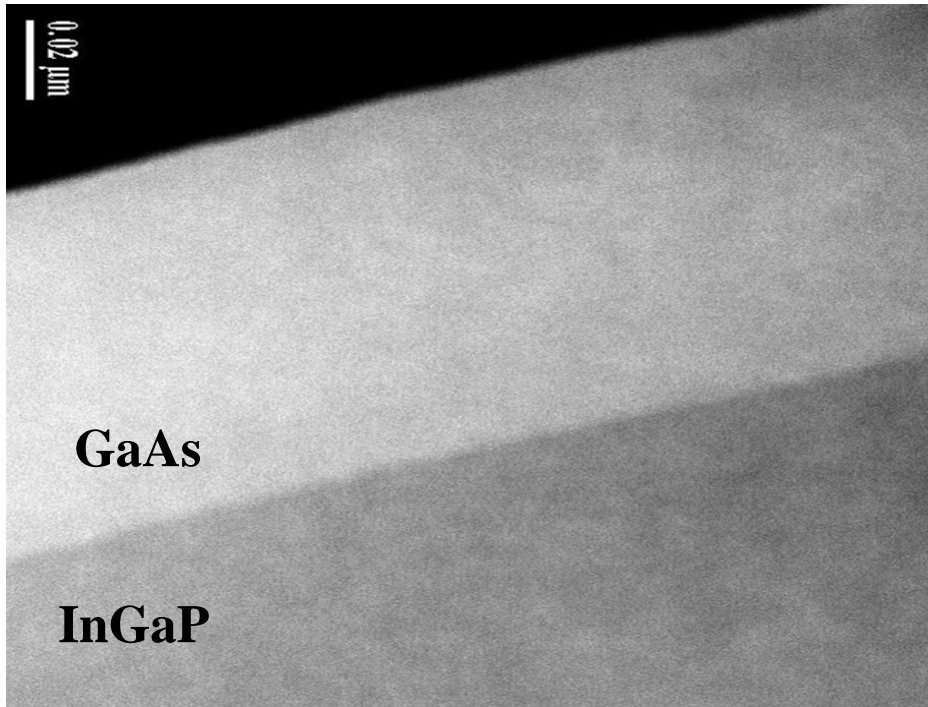


Fig. 5.12a The STEM image of sample with 3 sec PH₃ off

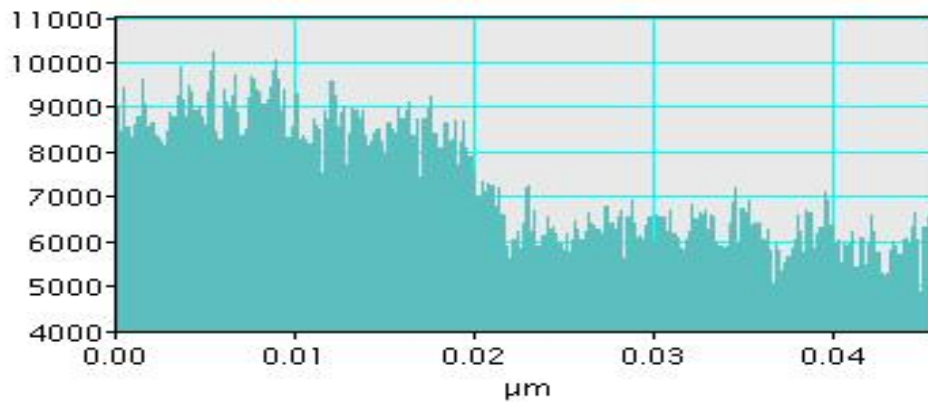


Fig. 5.12b The composition profile across the interface of GaAs and InGaP

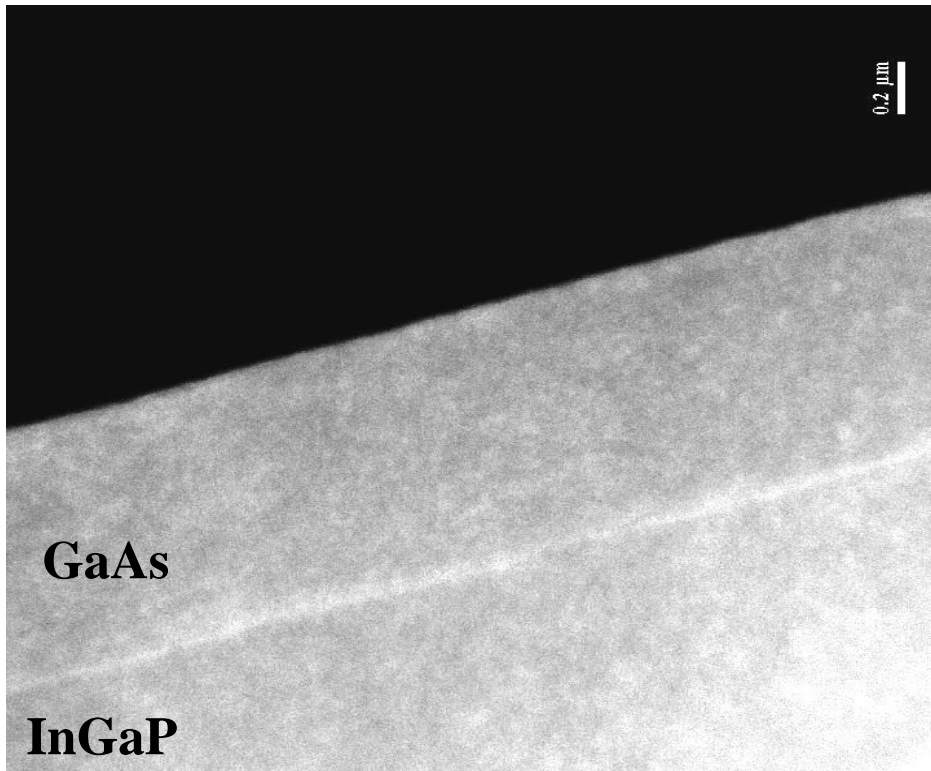


Fig. 5.13 The STEM image of the sample with 10 sec PH₃ off

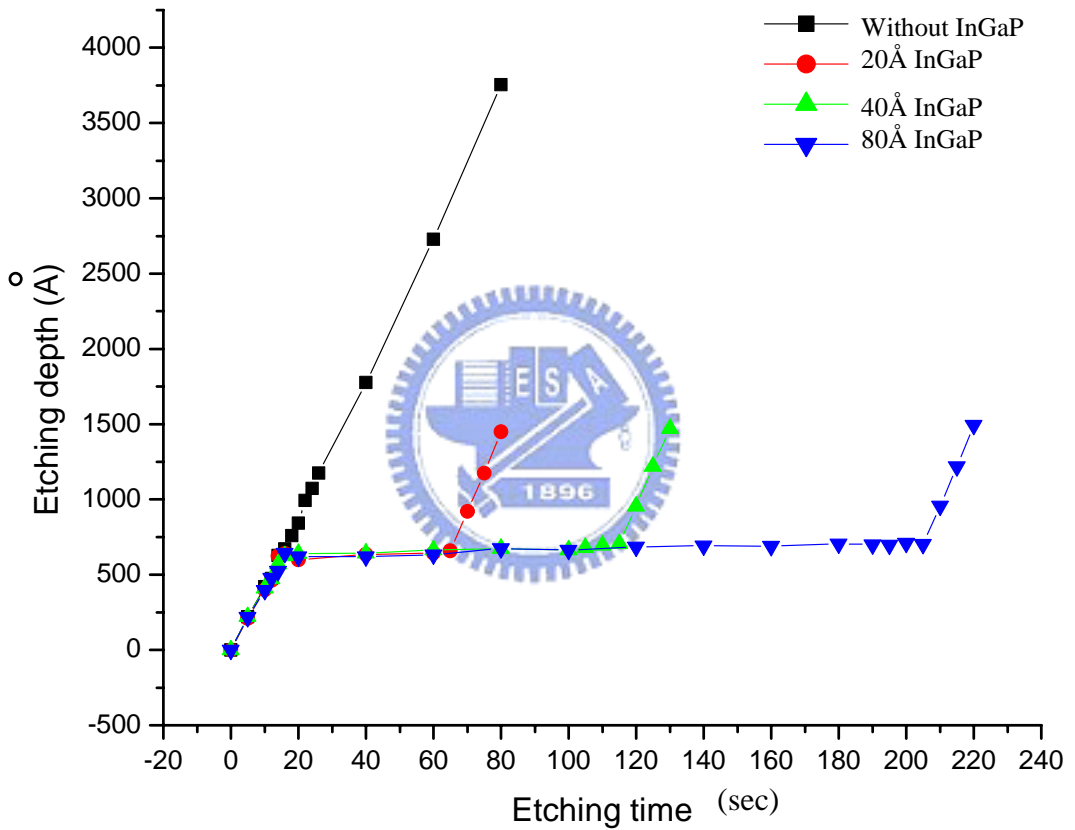


Fig. 5.14 The etching depth verse etching time of the samples with different thickness of InGaP layer