Fig. 5.1 The DCX data of Sample A, the flow rate of TMIn was 54 sccm.
Fig. 5.2 The DCX data of Sample B, the flow rate of TMIn was 51 sccm.
Fig. 5.3 The DCX data of Sample C, the flow rate of TMIn was 51 sccm but the Tg of InGaP was 700°C.
Fig. 5.4 The DCX of the lattice-matched InGaP layer, the flow rate of TMIn 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 verse 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 PH$_3$ off time.
Fig. 5.10d The PL intensity verse wavelength of the sample with 3 sec PH3 off time.
Fig. 5.10e The PL intensity verse 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.