

CHAPTER V

CONCLUSIONS

5.1 Heterostructure solar cells

Fabrication of AlGaAs/GaAs heterostructure solar cells has been conducted in this research by using both MBE and LPE growth techniques. There are six MBE samples having different detailed structures. These solar cell performances are compared to other two LPE samples. All MBE and LPE samples are tested for their spectral responses and I-V curve characteristics. All solar cell parameters are measured and calculated. It is being confirmed that wide gap AlGaAs window layers give better spectral response at short wavelength region. I-V curves at dark indicate the junction quality, e.g. leakage current and breakdown voltage. I-V curves at one sun illumination give information of solar cell parameters and efficiency.

In our experiment results, the efficiency of AlGaAs/GaAs solar cell is only 5% which is too small from the best data of more than 20%. This discrepancy comes from improper design of the devices as well as lack of experience in solar fabrication of the author.

5.2 Limitation of study

There is some time constraint in this research project which was conducted in few months time. However, in our discussion, we have mentioned some technical points which can be improved for better efficiency of the solar cells.

5.3 Further study

It is suggested that further study should be conducted on this research topic by additional experimental procedures.

- 1) Each sample should be coated by anti-reflection layer on the top of solar cell.
- 2) And each sample should be heavily doped on the rear surface for back surface field.