CHAPTER VII

CONCLUSIONS

Ohmic contacts are necessary in a wide range of semiconductor devices, but there is still no complete theory that accurately predicts the physical mechanisms that control their electrical character.[14]

This work is an experimental study of the chemical deposition contact. Nickel is plated on silicon by electroplating technique and electroless plating technique. But copper is only plated on silicon by electroplating technique. This work is confined on the ohmic contact in order to emphasize its quality aspects. The optimum condition for making a good contact can be reached. The good quality of ohmic contacts are verified by contact resistivities. On the basis of the calculation (chapter III), the lowest contact resistivities for the Ni-pSi, Ni-nSi, Cu-pSi, and Cu-nSi were 2.28×10^{-4}, 5.7×10^{-4}, 4.07×10^{-4}, and 3.02×10^{-4} $\Omega\text{-cm}^2$ and corresponding with the substrate resistivities 0.015, 0.012, 0.029, 0.013, and 0.116 Ω-cm respectively.

Furthermore, the technique was also applied to the fabrications of few devices at the SDRL. The contact properties of those devices are greatly improved. That is to following conclusions.

1) The characteristics of solar cells were shown that the electroplated contacts were better than the electroless plated contacts.

2) The result of alpha-radiation detector was better than that

obtained previously by the SDRL.[9]

It is shown clearly that the fabrication of contacts to semiconductor based on the technique produce good contacts. Hence, the performance of semiconductor devices are improved accordingly. Therefore, the SDRL will use this technique as a standard procedure for contact deposition on semiconductor. The applications for a large area were shown in Appendix F.