

## CHAPTER V

### CONCLUSIONS

The thin film coating of styrene monomer through vapor phase monomer deposition polymerization can be initiated by external UV irradiation in the atmospheric pressure system. The system needs the inert gas purging to flush out the air/oxygen inhibitor. A low substrate temperature is essential for monomer condensation. A high intensity UV irradiation together with a suitable photoinitiator are also required to induce polymerization.

Deposition weight and molecular weight of the deposited film are found to increase with the increments of the amount of photoinitiator, deposition time, and flow rate, and with the decrement of substrate temperature.

The optimum conditions for the deposition of polystyrene thin-film via the atmospheric vapor deposition polymerization with ultraviolet irradiation are: -5.0 °C substrate temperature, 0.8612 mmole of photoinitiator, 4 hrs. deposition time, and 123.0 ml/min. N<sub>2</sub> flow rate.