

## CHAPTER 7

### CONCLUSION AND ADVANTAGES

#### 7.1 Conclusion

A RF-PECVD system was set-up. The impedance matching network consists of a transformer with a turn ratio of primary coil to secondary coil of 7:1 and a variable vacuum capacitor. The load impedance can be matched to the RF generator by tuning the capacitor. A planar coil with a diameter of 10 cm was located outside the reactor chamber and a dielectric quartz window was placed in between them. The RF power is coupled to the plasma across the dielectric window. By using Precision LCR meter, inductance of the planar coil has been determined as  $45.6 \mu H$ . A Rogowski coil with a calibration factor  $0.4952 \text{ AV}^{-1}$  was used to measure the coil current and a high voltage capacitive probe with a calibration factor 37.683 was used to measure the coil voltage.

The distinct modes of discharge have been observed namely the E-mode discharge and the H-mode discharge. Transition from E-mode to H-mode of the RF-ICP system for gas argon was studied. The typical observations during the transition mode are a sudden drop in coil current, a dramatic increase in plasma luminosity, and an increase in the total reflected power. Since the forward transition does not correspond to the reverse transition, so hysteresis behavior was observed.

Polymer thin-film can be prepared from monomer vapor by the use of glow discharge. Polyacetylene thin-films were prepared from monomer vapor of acetylene by using the RF-PECVD system. From the IR spectra and the NMR spectra that to be used investigate the thin-film can indicated as, This thin-films are polyacetylene thin-film.

## 7.2 Advantages and applications of this research

From this work, RF-PECVD system design and construct. The polyacetylene thin-film have been obtained. Improvement of quality of polyacetylene thin-film can be done such as surface modification. It is interesting to further study other possible better way for thin-film coating. In the future work, RE-PECVD system can be used to develop polyacetylene thin-film for coating surface of contact lens.



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