

## CHAPTER V

### CONCLUSIONS AND RECOMMENDATIONS

#### 5.1 Conclusions

In this study, bacterial cellulose membranes from Nata de coco with and without silver ions were prepared for CO<sub>2</sub>/CH<sub>4</sub> separation. Bacterial cellulose membranes without silver ions were prepared by varying the weight ratios of dried Nata de coco to water. The densification of bacterial cellulose membranes decreased when the amount of water increased. Bacterial cellulose membrane with the weight ratio of 1:10 achieved the highest CH<sub>4</sub>/CO<sub>2</sub> selectivity and thus it was used for impregnating AgNO<sub>3</sub> solutions to study the gas separation performance. From all results it can be concluded that the 1.0M Ag<sup>+</sup>-BC membrane showed the highest CH<sub>4</sub>/CO<sub>2</sub> selectivity when compared with the pure bacterial cellulose membrane, 0.1M Ag<sup>+</sup>-BC and 0.5M Ag<sup>+</sup>-BC membranes. Increasing the AgNO<sub>3</sub> solutions concentrations could improve the CH<sub>4</sub>/CO<sub>2</sub> selectivity.

#### 5.2 Recommendations

The main problems in this research are the sample morphology, these membranes could not be controlled the void size within the membranes and the void size of the membranes is rather large. Thus, the modification of the membrane structure is the very important issue in the further works. Another problem is about the oxidation of silver nitrate, which was impregnated into bacterial cellulose membranes, with the oxygen in the air easily caused the color of these membranes changed into the black color. Therefore, the silver ions-impregnated membranes had to be kept in the vacuum container before used.