CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

5.1 CONCLUSIONS

In this work, preparation of boehmite/polymer composite fibers and the reaction to convert the composite into alumina nanofibers were investigated. The conclusions of the present research are the following:

1. α-Al_2O_3 nanofibers can be synthesized via the calcination of boehmite/PVA composite fibers produced by combined sol-gel and electrospinning techniques.

2. The different morphology of the product gives different product properties. The crystallite size of the electrospinning products is smaller than that of the product in form of powder because the morphology as the fiber controls the growth into one dimensional.

3. When amount of acid is increased by 10-fold, the phase transformation temperature of the calcined product is greatly influenced, especially for the electrospun fibers. The crystallinity of the product increases when the acid-to-AIP is increased.

5.2 RECOMMENDATIONS FOR FUTURE WORK

For the synthesis of α-Al_2O_3 from electrospun boehmite/polymer composite nanofibers, using by combined sol-gel and electrospinning techniques, effects of various factors, such as aging time and amount of acid as well as conditions for the electrospinning, on morphology of α-Al_2O_3 fibers were investigated in this work. Some recommendations for future studied are proposed as follows:

1. Other alumina precursors should be further investigated.

2. The morphology of fibers in various calcined temperatures should be varied and investigated.

3. For the reaction to convert the composite into α-Al_2O_3, other type of acid, such as hydrochloric acid, and nitric acid should be investigated.

4. The mechanism of hydrolysis and condensation in sol-gel technique should be further studied in detail.