

## CHAPTER V

### CONCLUSION

#### V.1 Conclusions

1. The results indicate that 0.5 M acetic acid treatment with 45 minutes of adsorption time yields the best adsorption capacity for natural zeolite. This duration maximizes the adsorption efficiency of the zeolite without compromising its crystallinity. It is crucial to maintain the structural integrity of the zeolite while enhancing its catalytic properties.
2. The research findings demonstrate that the adsorption capacity of zeolite for acetic acid is influenced by the concentration of acetic acid, but the relationship is not linear. It is noticed simply increasing the concentration of acetic acid from 0.5 M to 1.0 M yielded the highest increase in adsorption capacity from all the concentration that was tested. Further increasing the concentration from 1.0 M to 1.5 M has been shown to have little effect. However, increasing the concentration towards 2.0 M and 2.5 M resulted in a higher adsorption capacity. This suggests that at higher concentrations, the zeolite surface can still accommodate additional acetic acid molecules, leading to an increased adsorption capacity.
3. FTIR analysis shows an increase in Brønsted acid sites for acetic acid-treated zeolites. Furthermore, XRD analysis shows that acetic acid treatment shows no significant change towards the crystallinity of the experimented zeolite, though several introduced a decrease in crystallinity. Zeolites that are treated with 0.5 M acetic acid with 75 minutes of adsorption time presented the highest intensities indicating better removal of impurities.

#### V.2 Suggestions

1. Based on the results of this study, further experiments with higher concentrations of acetic acid to measure adsorption capacity and to measure the effects towards the characteristic of the zeolite are called upon.

2. Further analysis in XRF to confirm the Si/Al ratio of the zeolite, and analyzing the pore sizes and surface area is important to confirm the effects of acetic acid treatment on zeolite.