CHAPTER 5
CONCLUSION

5.1 Conclusion

From the research done, the synthesis done with both combinations of glucose and curcumin can produced particles up to 379.4 mg at 90˚celcius when compared to only using sugar which can produce silica particles up to only 264 mg. From XRD analysis, curcumin also shows their ability as a stabilizing agent for the particle in which from the Scherrer equation, it is found that the particle size is around 0.25 nm in size and provide a sharp peak on the XRD analysis. In the adsorption studies, both particles SP-GC and SP-G does not show significant differences in which during kinetics adsorption it is found that SP-GC managed to adsorb sodium diclofenac up to 74.8% while SP-G manage to reach adsorption of sodium diclofenac up to 72,2% at maximum adsorption time of 300 minutes or 5 hours. During isothermal adsorption done in various temperature for 6 hours, it is found out that SP-GC can reach up to 77.4% of sodium diclofenac adsorbed at 50˚C while SP-G at 50˚C can adsorb sodium diclofenac up to 75.7%. Lastly in the release study, sodium diclofenac released in PBS medium provides a burst release at the first 5 hours and later becomes a slow release in which the first 5 hours SP-GC managed to released up to 84% and SP-G released up to 85.3% which later seen at 25 hours SP-GC release can reached up to 96.8% and SP-G reached up to 98.8%.

In conclusion, curcumin in addition into glucose as reducing agent helps in providing a much higher yield production from the TEOS solution into silica particles and giving smaller size of particle in the process. In other case however, curcumin does not provide much significant comparison in isothermal and kinetics studies in the experimentation except for the amount of drug able to be adsorb by the particles. In release, curcumin provides some differences where nanoparticles produced can sustain a longer period of release rather than the glucose produced silica nanoparticles.

5.2 Suggestions

If this research is continued or similar research are done, some suggestions which can be given is that more characterization should be done for this material such as Transmission Electron Microscope (TEM), zeta sizer or Fourier-Transformed Infrared Spectroscopy (FTIR) to find the nanoparticles specific size and composition. Another suggestion is that isothermal adsorption should be done in many more variables such as variation of concentration of adsorbate and adsorbent along with different temperatures so that the most optimal condition at which adsorption done can be found along with their isothermal model analysis. For release, suggestion that can be given is that the time in which the drug released can be optimized at a longer period as it can be seen in the data that percentage released can completely be maximized when done at a longer period. Lastly, when doing a similar experiment, it is suggested to find the possible

causes for degradation of the medicine as degradation of the medicine tends to cause instability of in UV-Visible spectroscopy readings.

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