CHAPTER V
CONCLUSIONS AND RECOMMENDATIONS

V.1. Conclusions

From the research results concerning Metal-Organic Framework as a drug carrier of Furosemide, it can be concluded that:

1. The optimum molar ratio of NaOH added in the synthesis of MIL-100(Fe) was found to be X=3 with the highest % yield of 66.00% and least formation of $Fe(OH)_3$ as by-product.
2. The effect of adsorbent dose exhibits a decrease number in the value of Furosemide adsorbed into the adsorbent at equilibrium time and at a specific time as the mass of adsorbent increases, vice versa.
3. The adsorption kinetic could be represented by the pseudo-first-order model with R^2 ranging from 0.993 to 0.995, while the adsorption isotherm fitted well with Langmuir isotherm model ($R^2 = 0.995$) indicating that the adsorption process is monolayer and homogenous.
4. The release of Furosemide from MIL-100(Fe) at PBS pH 5.8 exhibit two specific stages, which are rapid release up to 35.31% (of cumulative release) observed within the initial 8 h followed by slow release up to 41.56% (of cumulative release) observed within the next 16 h. Meanwhile, the release at PBS pH 7.4 demonstrate consistency in releasing drug, shown from the percentage of cumulative release that keeps rising to 68.46% (of cumulative release) throughout 24 h.

5. The release of Furosemide from MIL-100(Fe) in PBS at pH 5.8 and 7.4 fitted well with the first-order kinetic ($R^2 = 0.989$) and Korsmeyer-Peppas model ($R^2 = 0.991$), respectively.

V.2. Recommendations

We suggest that other researchers are willing to examine MIL-100(Fe), Furosemide, and loaded MIL-100(Fe) using Fourier Transform Infrared (FTIR) in order to confirm the loading of Furosemide into MIL-100(Fe). Analyzing the zeta potential values of MIL-100(Fe) and Furosemide are also necessary to obtain further elucidation concerning the interaction between the adsorbate and adsorbent in the adsorption process. Modification such as coating of MIL-100(Fe) particle is also recommended to acquire a particle with outstanding ability for drug delivery and other applications.

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