COMPARATIVE ADSORPTION OF COPPER(II) AND LEAD(II) FROM AQUEOUS SOLUTIONS ON SOURSOP (*Annona muricata*) LEAVES

NUR SABARINA SYAHIRAH BINTI MOHD FATHI

Final Year Project Report Submitted in
Partial Fulfillment of the Requirement for the
Bachelor of Science (Hons.) Chemistry
in the Faculty of Applied Sciences
Universiti Teknologi MARA

JANUARY 2019

ABSTRACT

COMPARATIVE ADSORPTION OF COPPER(II) AND LEAD(II) FROM AQUEOUS SOLUTIONS ON SOURSOP (*Annona muricata*) LEAVES

The investigation regarding the potential of soursop (*Annona muricata*) leaves as an adsorbent for the comparatives removal of Cu^{2+} and Pb^{2+} ions from aqueous solutions was conducted. The influence of pH, dosage, contact time and initial metal concentrations were studies in batch experiments at room temperature (298 K). The AML used in this study was characterized by FTIR spectroscopy. The presence of –OH, -NH_2, C=S, -CO, and C=O groups was presented during analysis of FTIR spectra. One of the main mechanisms for the removal of Cu^{2+} and Pb^{2+} was complexation as indicated by FTIR spectra. The pH_{zpc} value of the AML was 5.98 and the maximum metal adsorption was at pH 5. The result at effect of dosage also indicated that the percentage removal of heavy metal ions (Cu^{2+} and Pb^{2+}) was increasing with the increasing of amount of dosage. From the result, it is showed that the maximum percentage removal for Pb^{2+} (97.98%) is higher compared to Cu^{2+} (82%). The adsorption for both heavy metal ions was rapid at the first 5 minutes of contact, however slowly achieved the equilibrium time at 45 minutes agitation. Kinetic studies showed good correlation coefficient for the Pseudo-second order kinetic model. Meanwhile, Langmuir model was indicated to be more fitted than Freundlich model for the equilibrium data which gives $R^2 = 0.9987$ for Cu^{2+} ion and $R^2 = 0.9515$ for Pb^{2+} ion. Based on the FTIR spectra, kinetic and isotherm studies, it can be concluded that the higher adsorption of heavy metal ions onto the AML is Cu^{2+} ion.

TABLE OF CONTENTS

CHAPTER 5 CONCLUSION AND RECOMMENDATION

LIST OF TABLES