

CHAPTER 1

INTRODUCTION

1.1 Background of Study

This study focused on the Geochemistry Characterization of organic soil for geotechnical engineering in Johor state, Malaysia. Many of the researches about geochemistry characterization on the soil had been conducted previously, but most for the research done mainly for the agricultural purpose to improve the quality of soil for the plantation only. It is hardly and almost none of the similar type of research carries out for the engineering purpose especially for the organic soil.

Most of the researchers are more concern about the peat soil instead of the organic soil which consists of lower organic content. It is important to have geochemistry characterization on the organic soil especially in our country, Malaysia. Thus, a study of geochemistry characterization on organic soil was carried out to investigate its physical and chemical properties.

1.2 Problem Statement

Organic soil for example peat soil is one of family of the organic soil which is widely found in Malaysia. Generally, organic soil is a problematic soil to the construction which will cause possible shear failure, low bearing capacity and different settlement.

Due to these problems, removal of the organic soil is a normal practice for the civil engineer whenever this kind of soil is encounter at the site and this will then lead to the increase of the cost of the construction and delayed the duration of completion. Somehow it is impractical and uneconomic to have the removal work when there is more than 10 meters depth organic soil deposit below the existing ground surface.

Besides that, due to the rapid development of our country, many construction is undergo and the lacking of the suitable land cause the construction have to be construct on the organic soil and various construction techniques have been carried out to support embankments over peat deposits without risking bearing failures but settlement of these embankments remains excessively large and continues for many years.

In order to solve the organic soil problem a good understanding of the organic soil are needed and lot of researches are done to solve the problem for the organic soil and it is also important to indentify and investigate the effect chemical compound of organic soil to the soil properties to solve the problem.

1.3 Objectives

Objectives of this study are:

- 1) To determine the physical and geochemistry properties of organic soils.
- 2) To characterize the geochemistry properties of organic matter.
- 3) To correlate the geochemistry properties of organic soil and its physical properties.

1.4 Scope of Study

The study was conducted on organic soil which obtained from three different sites, namely Parit Sidek, Parit Nipah and Batu Puteh in Johore. The geochemical characterization of the organic soil was done on the soil through two type of the test, which was the physical test and chemical test. The physical test such as Atterberg limit test, moisture content, specific gravity test and etc were conducted to determine the physical parameter of the soil. On the other hand, the chemical tests such as Total organic carbon and loss on ignition were conducted to determine the organic content of the soil. Other chemical tests were carried out to determine the pH value, Cation Exchange Capacity (CEC), Sulphate content and Chloride content of the soil. The Sulphate and Chloride content of the soil determined in this study were the water soluble type. The insitu Vane Shear test was conducted to obtain the physical parameters for the soil at the site