

CHAPTER I

INTRODUCTION

Biodiesel is produced from vegetable oil or animal fat by transesterification. In biodiesel production process, basic homogeneous catalyst is added to accelerate the reaction, usually is NaOH, KOH or NaOCH₃. After reaction, the remaining catalyst has to be removed by using acid neutralization to change the catalyst into form of solid salt and came out with biodiesel solid waste.

After the reaction, the catalyst has to be removed by using acid neutralization resulting in precipitation of inorganic salt as a solid waste. In biodiesel production process, this solid waste is also contaminated by organic compounds such as glycerol, free fatty acid and other glycerides. Bohon *et al.* (2011) studied about combustion of glycerol by 82kW high-swirl refractory burner and characterizes the emissions generated during glycerol combustion. It was found that glycerol was completely removed and 40 % of fly ash was Na which was NaOH catalyst used in transesterification process. The purpose of this work is to find the method to eliminate organic compounds from biodiesel solid waste. Several methods are used to separate organic compounds from biodiesel waste.

If organic compounds can be removed from the solid waste, the purified solid salt will be obtained which possibly can be used in other applications. The purpose of this work is to perform experimental test and evaluate the technique to eliminate or separate organic compounds from biodiesel solid waste. First technique is combustion. The solid waste sample is heated in furnace in different temperature in order to completely decompose the organics part. Second method is the extraction of the soluble inorganic salt by using water, filtering out from insoluble organics and subsequently precipitating the inorganic out from aqueous solution. In this case alcohol (methanol or ethanol) is used to precipitate inorganics out from solid waste solution. The purified solid wastes are confirmed for its components and purity by using XRD, XRF and AA analysis.