SCREENING AND OPTIMISING METAL SALT CONCENTRATION FOR HARVESTING *NANNOCHLOROPSIS* Sp. BY FLOCCULATION

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ABSTRACT

Biodiesel is a renewable fuel that is non-toxic, biodegradable, and constantly increasing in demand as the reservoir of fossil fuel is depleting. The microalgae biomass with high oil content is significant as a sustainable resource for biodiesel production. Production of biodiesel using microalgae biomass appears to be a feasible alternative due to no confliction with food supply compared with the first generation biofuels. This report deals with the screening and optimisation of metal salts for harvesting marine microalgae by flocculation. The metal salts studies are ferric chloride, aluminium sulphate and ferric sulphate. Wild Nannochloropsis strains of microalgae were cultivated aseptically in seawater for seven days, after that the microalgae was harvested by using flocculation step with different concentration of metal salt. In order to monitor the efficiency of the metal salt, the turbidity region of microalgae in glass cylinder before and after flocculation was observed. Besides that cell, dry weight was also compared for three-flocculation agent used. The most efficient metal salt was then further optimized for its best-performed concentration and pH. Chloride salts ($FeCl_3$) was found to be more efficient in comparison with sulfate salts ($Al_2(SO_4)_3$ and $Fe_2(SO_4)_3$) in harvesting microalgae. Ferric Chloride was further optimized, where the optimum pH and concentration of $FeCl_3$ are 8.5 M and 1.0 M, with flocculation efficiency of 90 % and cell dry weight of 3.8 g. In conclusion, 1.0 M ferric chloride salt at pH 8.5 is optimum in harvesting Nannochloropsis sp. microalgae by flocculation.

KEYWORDS**:** *Microalgae; flocculation; pH; nannochloropsis sp.; biodiesel*

1.0 INTRODUCTION

In the wake of diminution in fossil fuel reservoir, heaps of research exploring alternative fuel has been done. Biodiesel that emits much lower toxic air may be an option in resolving this problem. Consequently, it has become constantly increase in demand. Among the alternatives studied in producing biodiesel, microalgae have been proposed to be the potential solution to defeat this crisis (Chisti, 2007; Khan, Rashmi, Hussain, Prasad & Banerjee, 2009; Mata, Martin & Caetano, 2010; Singh & Gu, 2010). As

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