

**EFFECT OF INLET TEMPERATURE AND
FLOW RATE TOWARD PRODUCE 2%
CARBOXYMETYL CELLULOSE SPRAY
DRIED POWDER**

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JANUARY 2017

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ACKNOWLEDGEMENT

In preparing this project, I was in contact with many people, academicians, and practioners. They have contributed a lot towards my understanding and thought about this project. First of all, I would like to raise my praise to the almighty ALLAH S.W.T because of His blessing and for giving me strength and capabilities to finish this research for CHE 697. In particular, I would like to express my sincere appreciation to my research project supervisor, Prof. Madya Dr. Norazah Abd Rahman for her invaluable guidance, encouragement and friendship. Without her continuous support and guidance, this research project may not be the same as presented here. Also, I would like to express my appreciation and thousands of thanks to Puan Nor Suhaila Sabli, En. Abd. Jamil Lam and Puan Azizan Din for their professional guidance, critics, supports and encouragement. Their professionalism and helpful critics cannot be paid with even thousands of thanks. Not forgettable to my family that has been the most important people to me that have supported and encouraged me to finish this research in order to get an excellent result for this research. Without their encouragement, I maybe will not finish this research. My heartiest appreciation also for my fellow friends who have directly and indirectly had gave their support and encouraging critics to help me finish this project. Most importantly, I am very grateful and infinite thanks to Allah for giving me strength, powerful guidance and His blessing until I can complete this task finally.

ABSTRACT

Carboxymethyl cellulose (CMC) can be synthesized from waste such as empty fruit bunch or sago pulp and is commonly used in detergent and pharmaceutical product. Currently, CMC is delivered in liquid and fibre condition which incurred high cost and difficult to handle. Thus, CMC needs to be converted to powder form for ease handling. A study was done to determine the suitable inlet temperature and flow rate of producing 2% CMC powder by using spray dryer. Results showed the high inlet temperature and low flow rate of pump recovered more powder than low inlet temperature and high flow rate. Then, the research were scale up at pilot plant by using parameters that have been obtained in bench scale. Powder obtained from scale up process were analyzed and it was found that the powder produced at high temperature and low flow rate have low moisture content, low viscosity and less yellowness index (YI) compared with TL100 given by the industry. As a conclusion, high temperature and low flow rate of speed pump are suitable to recover 2% CMC solution synthesized from empty fruit bunch

Keywords – Carboxymethyl cellulose (CMC), empty fruit Bunch (EFB), Spray Drying

CHAPTER 1

INTRODUCTION

1.1 RESEARCH BAKGROUND

Cellulose is natural polymer which is long chain attach with small molecule. It can found from the nature, it is biomass waste such as empty fruit bunch, wood or leave (Senese F., 2010). The application of cellulose is pharmaceutical product, food product and building materials.

In addition, modification of cellulose is carboxymethyl cellulose (CMC), nitrate, cellulose carbonate and methyl cellulose (Chng L. M., 2010). Among of this modification, CMC is important because of the low toxicity and easy to handle. The application of CMC is ice-cream making and gluten free in food products, tooth paste, diet pills, detergent and water-based paints in non-food product and thickening agent in pharmaceutical product.