CHAPTER 13

PACKED REACTORS PERFORMANCE IN BIODIESEL MANUFACTURING FROM BULK OIL

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1. Introduction

The increasing demand for fuel creates a new challenge to develop alternative fuels that can meet demand. Biodiesel is one of the fuels that are seen as replacing petroleum fuel. Biodiesel is an alternative fuel that can be degraded naturally by more than 90% for 21 days. Biodiesel also has advantages, including combustion efficiency and a higher devil rate than petroleum-derived diesel fuel [1]. Current methods to improve the biodiesel production process can be done using membrane reactors [2]. Meanwhile, researchers used a fixed bed reactor and produced the highest % FAME, 98% [3]. Based on the above studies, this study examines the packed reactor's performance to obtain the highest biodiesel conversion. In general, the manufacture of biodiesel through esterification, transesterification, and esterification transesterification processes [1][4]. The reaction that occurs during the manufacture of biodiesel is a back and forth reaction. Esterification reaction:

RCCOH	+	CH_3OH	$\longleftrightarrow$	RCOOCH3	+	H_2O
Fatty Acid		Metanol		Metil Ester		Air

The factors that influence the esterification reaction above are reaction time, stirring, catalyst, and reaction temperature.