

CHAPTER 1

Introduction

1.1. Introduction

Gasoline standards throughout the world are continuing to move toward cleaner burning gasoline. This includes mandating limits on aromatics, benzene, sulfur and distillation characteristics. All of these changes must be met while maintaining or increasing gasoline octane number. Some of the possible blend stocks that fulfill the above requirements are isomerate, alkylates, oxygenates and iso-octane.

While isomerate offers some octane boos, it is substantially less than the boost derived from alkylate , oxygenates

Conventional alkylation units all use sulfuric or hydrofluoric acid as catalyst, which are highly corrosive and toxic and would raise significant environmental concern. In addition , alkylate is normally not a commercially available commodity but a rather a captive stream used in the refinery.

As for oxygenates, Methyl-Tert-Butyle-Ether (MTBE) became the single most widely used oxygenate for enhancing gasoline octane number, primarily for its superior blending characteristics and economics compared to other oxygenates such as ethanol , TAME and ETBE

This gives a reason for the increasing demand for MTBE as a gasoline additive. Currently, the worldwide consumption of MTBE reached 6.6 billion gallons of which 65% is consumed in the United States. (AL-HARTHI, 2008).

In order to improve the quality of the gasoline produced in the Sudanese refineries as well, this project studies the implantation of an MTBE plant with a capacity that suffices the production rate of Sudanese gasoline.

1.2. Scope and Objectives of Study:

1.2.1. Scope of study:

The scope of this project is to give a comprehensive study for an MTBE plant installation. The project will cover the following:

- 1-Material balance
- 2- Energy balance
- 3- Process design .
- 4-Cost estimation.
- 5- Plant location.

All calculations are performed using Excel spread sheets

-Objectives:

Motivated enhance the properties of gasoline produced from Khartoum refinery and increase the octane number for him, the objective of this project is to plan the work of MTBE process for the production of 112,200tons / year (112,200,000 kg/y). Which is amount required to cover the refinery's production of gasoline by mixing 10%.