4000 吨/年己二酸二乙酯生产装置工艺初步设计

摘　　要

本文对 4000 吨/年己二酸二乙酯生产装置初步设计，生产工艺为连续加压酯化工艺，选用的催化剂为对甲苯磺酸。原料为 99.9%的己二酸和 99.5%的乙醇混合进料，先经预酯化釜、沉降釜、酯化反应器进行充分的酯化反应，再经闪蒸器、精馏塔进行产品精制提纯。最终得到 99%的己二酸二乙酯。

设计内容主要包括酯化釜的选型设计、沉降釜的体积确定、酯化反应器选型及管长计算等。通过物料衡算和热量衡算对设备进行选型与设计；通过 Aspen plus 模拟，产品达到了实际生产中的质量指标；对自动控制方面进行了设计并绘制了 PFD 图、PID 图、酯化设备图以及车间的平立面布置图。

关键词：己二酸二乙酯；连续酯化；催化剂；设备计算

Preliminary design of 4000t/a diethyl adipate production plant

Abstract

This paper made a preliminary design for the diethyl adipate production plant for 4000 tons/year. The production process is continuous pressure esterification process, and the catalyst selected is p-toluenesulfonic acid. The raw materterial is 99.9% adipic acid and 99.5% ethanol mixed feed, which is fully esterified by pre esterification reactor, settling reactor and esterification reactor, and then refined and purified by flash reactor and distillation tower.Finally, 99% diethyl adipate was obtained.

The design mainly includes the type selection design of pre esterification reactor,the volume determination of settling reactor, the type selection of esterification reactor and calculation of pipe length. Through material balance and heat balance the equipment is selected and designed; after Aspen plus simulation, the quality index in actual production was achieved. At last, we designed the automatic control and draws the PFD diagram, PID diagram, esterification equipment diagram and the plane-elevation layout diagram of the workshop.

Key words: Diethyl adipate; continuous esterification; catalyzer; equipment design

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