# 年产 10 万吨乙烯气相法合成醋酸乙烯精制工段设计

**摘　　要：**本文是针对年产 10 万吨乙烯气相法合成醋酸乙烯精制工段进行的反应设计。醋酸乙烯目前主要是以乙烯气相法和乙炔气相法作为目前主要的工业生产方式，其中前者以醋酸、乙烯、氧气为原料，具备着安全、经济、设施设备易于大型化等优点，是本设计所选择的工艺。由于对产物纯度要求比较高，本设计主要针对的是精制工段的设计。根据设计规模的要求，对精馏塔中的反应进行了物料衡算；根据反应条件和物质的热力学性质，对精馏塔中的进出口热量和换热器中交换的热量进行了热量衡算。根据已求得的衡算数据，对精馏塔和换热器的设计参数进行了计算，对设备及部件的型号进行了选择。此外，对车间的布置情况进行了整体的要求和设计。对于环境问题与防范措施、安全和工业卫生等情况进行了充分地考虑。最后，对整个项目的技术经济性进行了分析，通过计算成本利润，可知运营之后大约 5.3 年可收回投资。

**关键词：**醋酸乙烯；乙烯气相法 ； 热量衡算；能量衡算；精馏塔

# Design of refining section for synthesis of ethylene acetate by ethylene gas phase with an annual output of $10 \times 10^4$ tons

**Abstract:** this paper is aimed at the annual output of 100,000 tons of ethylene gas phase synthesis of vinyl acetate refining section of the reaction design. At present, ethylene acetate gas phase method and acetylene gas phase method are the main industrial production methods, among which the former with acetic acid, ethylene, oxygen as raw materials, has the advantages of safety, economy, facilities and equipment are easy to large-scale, is the design of the choice of the process. According to the design scale, the material balance of the reaction in the distillation column was calculated. According to the reaction conditions and the thermodynamic properties of the material, the heat balance of the inlet and outlet heat in the rectifying column and the heat exchanged in the heat exchanger was calculated. According to the calculated data, the design parameters of distillation column and heat exchanger are calculated, and the model of equipment and components are selected. In addition, the layout of the workshop for the overall requirements and design. Environmental problems and preventive measures, safety and industrial hygiene are fully considered. Finally, the technical economy of the whole project is analyzed. By calculating the cost profit, it can be seen that the investment can be recovered in about 5.3 years after operation.

**Key words:** vinyl acetate; Ethylene gas phase method; Heat balance; Energy balance; Rectifying column

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