

1×10⁴t/a 巯基乙酸精制工段工艺设计

摘 要： 本文对年产 1×10⁴t/a 巯基乙酸项目巯基乙酸精制工段工艺设计进行工艺设计。介绍了用化学溶剂吸收法（MDEA 法）法进行深度脱硫得到富集的硫化氢气体，硫化氢与氢氧化钠溶液反应制得硫氢化钠，然后用硫氢化钠法生产巯基乙酸。

运用 Aspen Plus 软件对所选的硫氢化钠法的精制工段进行模拟得到物料衡算与能量衡算结果，并对巯基乙酸精馏塔进行设计优化，优化后的结果是塔板数 40，进料板取 24，回流比取 0.96。巯基乙酸精馏塔选用板式筛板塔，塔径 3.0 m，塔板间距 0.8 m，塔高 37.9 m。用 CUP-Tower 软件对精馏塔进行塔盘设计与校核，在操作条件下运行合理，并运用 SW6-2011 对塔机械强度进行校核，强度满足条件。最后对巯基乙酸精制工段进行了车间布置，并绘制车间布置图。

关键词： 巯基乙酸； Aspen Plus； 巯基乙酸精馏塔； CUP-Tower； SW6-2011

The Process Design of Mercaptoacetic Acid Refining

Section for 1×10^4 t/a Mercaptoacetic Acid Project

Abstract: In this paper, the process design of mercaptoacetic acid refining section of 1×10^4 t/a mercaptoacetic acid project is carried out. In this paper, the method of chemical solvent absorption (MDEA) was used to remove the sulfur in depth to get the concentrated hydrogen sulfide gas. The hydrogen sulfide reacts with sodium hydroxide solution to produce sodium hydrosulfide, and then sodium hydrosulfide is used to produce mercaptoacetic acid.

Aspen Plus software was used to simulate the selected refining section of sodium hydrosulfide method to get the results of material balance and energy balance, and to optimize the design of thioglycolic acid distillation tower. The optimized results are as follows: the number of trays is 40, the feed tray is 24, and the reflux ratio is 0.96. The mercaptoacetic acid distillation column is a sieve plate column with a diameter of 3.0 m, a spacing of 0.8 m and a height of 37.9 M. Use cup tower software to design and check the tray of the distillation tower. The operation is reasonable under the operating conditions. Use sw6-2011 to check the mechanical strength of the tower, and the strength meets the conditions. Finally, the workshop layout of mercaptoacetic acid refining section is made and the workshop layout is drawn.

Key words: Aspen Plus; Mercaptoacetic acid; Mercaptoacetic acid rectifying tower; CUP-Tower; SW6-2011

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