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过程系统工程

中小氮肥合成氨生产系统操作条件优化

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摘要 针对国内中小氮肥企业合成氨生产系统的设备条件和技术水平，以提高氨净值为目标，将整体优化问题进行合理有效的分解，采用广义预测控制算法实现氨合成塔热点温度自动调节，以保证在线优化调节的稳定；抽取单向优化因素进行卡边操作，最终实现合成氨生产操作条件的自适应在线操作优化，氨净值提高0. 4%，系统压力降低1. 2 MPa，实现节能降耗，说明了该方案的有效性。

关键词 自适应在线优化；预测控制；合成氨；氨净值
分类号

Optimization for operating conditions for synthetic ammonia system in medium and small scale nitrogen fertilizer plant

Abstract
Based on the condition of equipment and technical level of medium and small scale nitrogen fertilizer plants, increasing the net value of ammonia was considered as the goal of optimization study. The whole optimal problem was decomposed. Then the generalized predictive control (GPC) of the temperature of ammonia reactor hot spot for the stability of online-optimization adjustment, and boundary control for the single-direction factors were realized. Adaptive on-line optimization of operation conditions was successfully accomplished. The operation performance of ammonia reactor was improved, the net value of ammonia was increased by 0. 4%,and system pressure dropped by 1. 2 MPa.

Key words adaptive on-line optimization；predictive control；synthetic ammonia；net value of ammonia

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