Decoking scheduling for industrial naphtha cracking furnaces using a proactive strategy

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Continuous operation of naphtha cracking furnace leads to coke formation on the inner surface of the cracking coils. The coke increases with on-stream time and decreases productivity of the furnace. In order to restore productivity, the furnace operation is periodically stopped for decoking. Thus, optimization of the decoking schedule is highly desirable because the decoking sacrifices valuable production time. Measurement errors and unexpected changes in the coke growth rate cause uncertainties. Error accumulation by the uncertainties increases the gap between the furnace model and the real operation. To handle the uncertainties in the coke growth rate and the measurements, a 'proactive' scheduling strategy is proposed by extending the previously proposed sequential strategy. Superiority of the proposed proactive scheduling is verified by comparing it with a reactive scheduling strategy and a heuristic policy. (Acknowledgement:This work was supported by the BK21 Project, the IMT2000(project number: 00015993) in 2003, and Center for Ultramicrochemical Process Systems sponsored by KOSEF)