Periodic Scheduling of Multiproduct Continuous Plants using a RTN Continuous-time Formulation

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Abstract

This paper considers the problem of deriving an optimal periodic schedule for an M-stage, P-product multiproduct plant with sequence dependent changeovers. A Mixed Integer Non-Linear Programming (MINLP) continuous-time mathematical formulation is proposed, which allows for different product sequences in different stages and variable processing rates. The performance of the Resource-Task Network (RTN) based formulation is illustrated through the solution of a 2-stage, 3-product example problem, with the results showing it to be capable of achieving significant better solutions than the MINLP periodic scheduling formulation of Pinto and Grossmann (1994). However, the complexity of the proposed formulation is apparent and increases steeply with an increase in the number of products/stages.

Keywords: Periodic Scheduling, Resource-Task Network, Continuous-time Formulation

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