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Focused Plant Optimization Strategy for Polyethylene Multi-grades and Multi-sites Production
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Abstract
A petrochemical industry produces multiple grades of products along with a significant amount of 'off-spec' grades which are bi-products resulting from a transition phase between production of any two grades. While the optimization of grades production in different reactors is important, it is equally important to minimize the production of off-spec grades to minimize loss and reduce safety risks imposed on the reactor in every transition. The production of off-spec grades depends on many factors, particularly the number of grades produced in the reactor and the nature and duration of the transitions. In this study, an adoption of a 'focused plant' approach is used that meets the demand of different grades by assigning limited or focused grades to selected reactors based on their capabilities and constraints. A mixed-integer linear programming model is presented to determine the optimum grades selection for focused reactors of a plant and the quantity to be produced in each reactor to maximize overall profit. The model is applied on a case study with six reactors and twelve grades over a period of 1 year. © 2017, King Fahd University of Petroleum & Minerals.

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