SYSTEM ENGINEERING

基于浓度间隔分析的用水系统集成（II）不连续过程

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摘要　The first part of the series of this article proposed a systematic method for the synthesis
of continuous water-using system involving both non-mass-transfer-based and mass-transfer-
based operations. This article, by extending the method, proposes a time-dependent
concentration interval analysis (CIA) method to solve the problems associated with the
synthesis of discontinuous or batch water-using systems involving both non-mass-transfer-
based and mass-transfer-based operation. This method can effectively identify the
possibility of water reuse and the amount of water reused under time constraints for
minimizing the consumption of freshwater in single or repeated batch/discontinuous water-
using systems. Moreover, on the basis of the heuristic method adapted from concentra-tion
interval analysis method for the continuous process network design, the network design for
the discontinuous or batch process can be obtained through the designs for every time
interval. Case study illustrates that the method presented in this article can
simultaneously minimize the freshwater consumption in single or repeated
batch/discontinuous water system and can determine a preferable storage tank capacity for
some problems.

关键词　 water network　 target method　 discontinuous process　 concentration interval table

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Synthesis of water utilization system using concentration interval analysis method (Ⅱ) Discontinuous process

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Key words　 water network; target method; discontinuous process; concentration interval table

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