

Robust fuzzy optimization and multi-objective optimization approaches to generate alternate solutions towards resource conservation for eco-industrial parks considering various future events

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In this paper, we present a robust optimization approaches to generate alternate solutions for resource conservation in EIPs through water reuse networks considering various future events. In this contribution, two different optimization approaches are discussed and solved. In the first approach, an emergy-based fuzzy optimization model is presented and the objective function of the model is to maximize the overall degree of satisfaction. In the second approach, MOO is proposed to simultaneously minimize the total annualized cost (TAC) and regenerated flowrate. Through appropriate integration of regeneration unit with fixed outlet concentration into the base system, a 15.6%, 9.8%, 21.2%, and 16.2% reduction for overall emergy, TAC, freshwater, and wastewater respectively, is obtained than the direct reuse. Acknowledgements: This work was supported by the National Research Foundation of Korea(NRF) grant funded by the Korea government(MSIP) (No.2015R1A2A2A11001120).