

# Optimization of the Dual Mixed Refrigerant process for natural gas liquefaction with Deep Reinforcement Learning

We present an innovative approach to optimizing the Dual Mixed Refrigerant (DMR) process for natural gas liquefaction. The DMR process, characterized by its use of two distinct mixed refrigerants, offers significant advantages over traditional single-mixed refrigerant systems. However, the complexity of the DMR system, due to multiple refrigerant circuits and intricate interactions among them, poses substantial challenges for optimization.

We propose an optimization framework that integrates simulation techniques with Deep Reinforcement Learning (DRL). We test different DRL methodologies to illustrate how our DRL-based optimization framework can effectively improve the process's efficiency through parameter adjustments. This research contributes valuable insights into the application of Artificial Intelligence-Driven methodologies in industrial refrigeration processes.

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