

Performance enhancement of dual mixed refrigerant LNG process

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The nitrogen (N₂) expander liquefaction process has the highest ecological and safety advantages over different type of available commercial natural gas liquefaction (LNG) processes but its relatively low energy efficiency is the major issue. In this context, the optimum flow rate of high boiling component propane was mixed with conventional refrigerant N₂, resulting two-phase mixed refrigerant was appeared before expansion. The potential application of two-phase expander was investigated to generate the cooling effect through the expansion of high pressure two-phase propane-nitrogen refrigerant. The results reveal that the specific energy consumption for LNG production can be saved up to 39.8% and 39.4% in comparison with the conventional coal bed methane expander and N₂ single expander LNG processes respectively. This research was supported by Basic Science Research Program Foundation of Korea (NRF) funded by the Ministry of Education (2015R1D1A3A01015621) and also by Priority Research Centers Program through the National Research Foundation of Korea (NRF) funded by the Ministry of Education (2014R1A6A1031189).