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Pilot plant results of amine-based carbon capture with heat integrated stripper

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This study investigates the enhancement of amine-based chemical absorption for CO2 capture in the power industry, focusing on reducing energy consumption through the implementation of a Heat Integrated Stripper (HIS) with built-in heat exchangers. Despite its theoretical promise, there is a lack of experimental validation for the HIS modification. The research aims to assess the effectiveness of the modified stripper compared to the standard process, utilizing pilot plant data from Jaworzno and Łaziska Power Plants in Poland. Collaborating with the TAURON Group, a key player in the Polish energy sector, pilot tests employed a mobile plant with a 200 m3/h nominal gas flow rate. MEA 30% solvent was used in the pilot tests, and the results underwent data reconciliation for mass balances, heat losses, and process heat duty. The study reveals that heat integration positively influences the temperature profile in the stripper, leading to increased CO2 capture without additional heat input. With the escalating prices of CO2 emission allowances, this research addresses a crucial aspect of the national economy. The findings provide a foundation for the design of a scaled-up CO2 capture process incorporating HIS, offering potential solutions to mitigate the environmental impact of power generation.

Metryczka

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