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Carbon dioxide capture for aluminium production process

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Carbon capture process model was developed for the flue gas from aluminium production process. There are four different cases, which were considered for the simulation studies in Aspen Plus process simulation tool. Several CO_2 concentrations, 3, 4, 7 and 10 vol%, in the flue gas from the aluminium production is investigated. The required re-generation energy in the stripper section is in the range of 3.0 - 3.5 MJ/kg CO_2 for 85% removal efficiency and 3.2 - 3.5MJ/kg CO2 for 90% removal efficiency and 3.4 - 3.6 MJ/kg CO_2 for 95% removal efficiency. It can be clearly seen that, (58-65)%, (67-75)%, (61-67)% and (52-60)% of energy requirement of case I, II, III and IV (3%, 4%, 7% and 10% of CO_2 in the flue gas) can be replaced by available heat for replacing the re-generation process. According to the present study, it can be clearly stated that, 4% CO_2 content in the flue gas is given the optimum available heat to replace the maximum amount of energy requirement in re-generation process.

Biography

Dinesh Kawan received his B.E Degree (2010) in Electronics and Communication Engineering from Khwopa Engineering College, Purbanchal University, Nepal. He is presently pursuing his Master degree in System and Control Engineering in Telemark University College, Porsgrunn, Norway. He also working as a research assistant at faculty of Technology in same university college. Mr. Kawan has research interest on carbon capture, modeling and simulation, and control systems in process industries.

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