

Carbon Dioxide Capture from Flue Gas by Phase Transitional Absorption

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PROJECT SUMMARY

The critical issue for the success of Carbon Capture and Sequestration Program is the cost. The cost for CO₂ capture alone accounts for 75 percent of the total cost of capture and storage. How to reduce the cost for CO₂ capture is the key of the Carbon Capture and Storage Program.

The objective of this proposed research is to provide necessary data for process design and cost analysis. The ultimate objective of this proposed program is to develop a low-cost viable process to capture CO₂ from coal-based power plant flue gas based on Phase Transitional Absorption.

The proposed research is using a novel absorbent to absorb CO₂. The absorbent after absorbing CO₂ splits into two phases, CO₂ rich phase and CO₂ lean phase. After separating the two phases, CO₂ rich phase is forward to regeneration. After regeneration, the regenerated CO₂ rich phase combines CO₂ lean phase to form absorbent and complete the cycle.

The feature of the novel CO₂ capture technology is significantly saving on the operation energy cost without increasing the capital investment. The process evaluation was conducted by Nexant, Inc. based on our lab results. By comparing our process with Benchmark MEA (30% MEA aqueous solution) Process, Our technology is able to cut 80% of the operation energy cost of Benchmark MEA Process.